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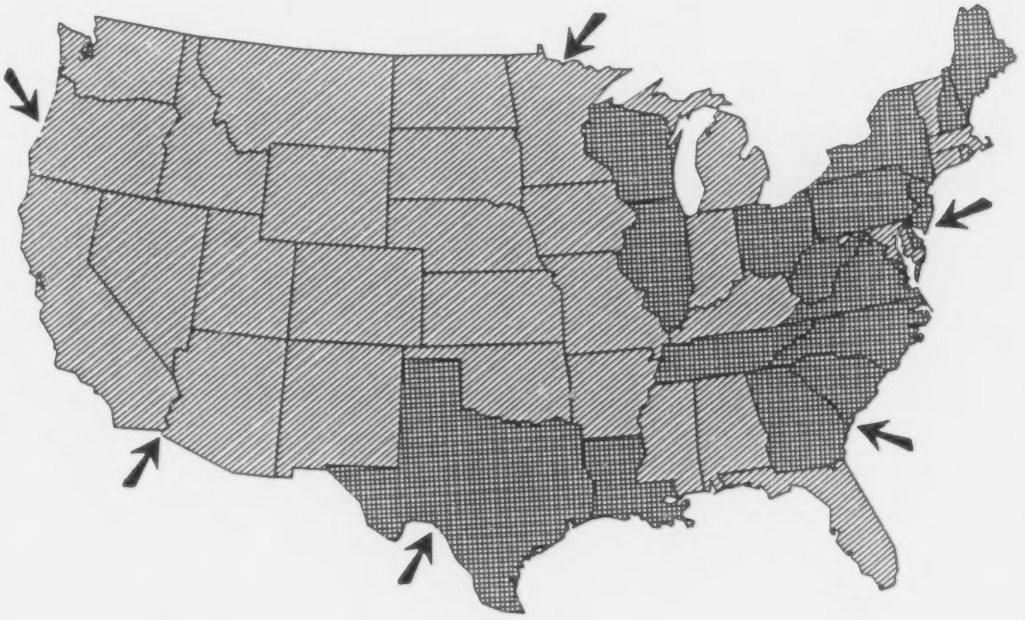
Regional Patterns of Manufacturing Foreign Direct Investment in the United States



Norman J. Glickman
Douglas P. Woodward

Special Project Report
1987

Lyndon B. Johnson School of Public Affairs
The University of Texas at Austin

Prepared for the U.S. Department of Commerce,
Economic Development Administration, Research and Evaluation Division

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A report by Norman J. Glickman and Douglas P. Woodward
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The statements, findings, and conclusions in this report are those of the authors and do not necessarily reflect the views of the Economic Development Administration.

ISBN: 0-89940-856-7
Library of Congress Catalog Card No.: 87-81462

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FOREWORD

This is the final report for Research Grant RED-837-G-85-10 from the Economic Development Administration to the Lyndon B. Johnson School of Public Affairs of the University of Texas at Austin entitled "The Regional Implications of Foreign Direct Investment in the United States." Throughout the project, we had the very helpful comments of Leonard Wheat of the EDA for which we are very grateful. We also thank EDA's David Geddes for his helpful advice. In addition, Michael Conroy, Niles Hansen, and Stephen McDonald read portions of this research and provided helpful comments. We had research assistance and additional comments from Geoffrey Bannister, Jose Casco, Michael Crowley, Michael Freudenberg, and Ram Mahidhara. Edward Bergman and the Southern Growth Policies Board kindly supplied some of the data used in Section 5.2. Yayoi DiSanto's tireless typing and retyping was extraordinarily helpful. Of course, we are responsible for any errors of fact or interpretation in what remains.

Norman J. Glickman
Douglas P. Woodward

ABSTRACT

A detailed profile of the regional location of foreign direct investment in the United States (FDIUS) is presented. Data from the Bureau of Economic Analysis reveal that there was a dispersion of FDIUS from traditional foreign firm locations in the Mideast, Great Lakes, and Southeast regions towards the South and West between 1974 and 1983. When adjustments are made for region size, the importance of southern states is more clear. Data from the International Trade Administration and the Japan Economic Institute confirm the pull of the South and of regions with growing markets. Southern states were able to attract a significant share of new plants; acquisitions and mergers were more likely to be located in the Northeast and Midwest. Regression analyses test the importance of regional markets, labor force and labor markets, unionization, development thresholds, taxes and spending by states, and other variables in explaining the location of FDIUS. Regressions of county-level locations test market access and transportation, labor, technology assimilation, and taxes on sub-regional location decisions by foreign companies. It is found that regional markets and energy costs played important roles in attracting foreign firms. At the county level, foreign firms tend to locate in high income and highly urbanized places.

EXECUTIVE SUMMARY

REGIONAL PATTERNS OF MANUFACTURING FOREIGN DIRECT INVESTMENT

THE UNITED STATES

by

Norman J. Glickman
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and

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Throughout the United States, foreign companies have been building new plants and acquiring existing ones. In doing so, they are beginning to change our economic landscape and the ways that we live and work. Foreign direct investment is part of a larger set of events that has internationalized the United States' economy in the past twenty-five years. These events have been pivotal in the structural transformation of national and regional economies. Vast increases in exports and imports, international migration, and the substantial investment of American multinational corporations abroad have further opened our economy to foreign influences.

Foreign investment in the United States (FDIUS) has become substantial in the past decade and has contributed to the growth of the economy. The 1985 book value of direct foreign investment was $183 billion, 14 times the 1970 level. In 1984, foreign firms had $596 billion of total assets, owned 13 million acres of land, and had mineral rights to an additional 63 million acres. They employed 2.7 million workers, about 3 percent of all employed. The 1.4 million workers in foreign-owned manufacturing plants represented 7 percent of all manufacturing employees.

A regional profile of FDIUS constructed from Bureau of Economic Analysis (BEA) data shows that eastern and northern regions, close to the principal sources of FDIUS and blessed with large markets, historically have received the largest share of manufacturing investment. But when foreign investment figures for property, plant, and equipment (PPE) are adjusted for population size or measured relative to domestic economic activity, foreigners show a distinct preference for southern states.

Overall, foreign firms are becoming more aware of and responsive to the diverse U.S. industrial landscape, as FDIUS has been decentralizing from the Northeast and Great Lakes, two of the major regions that have received large

amounts of investment. The third important recipient of FDIUS, the Southeast, continues to increase its share. The remoteness of interior regions no longer puts states at a disadvantage in attracting foreign investment. The Southwest (dominated by Texas, with great amounts of energy-related investment), Rocky Mountains, Plains, and Far West regions enjoyed greater-than-average manufacturing growth between 1974 and 1983. Interior states with historically low levels of manufacturing activity such as North Dakota, Montana, and Wyoming attracted a surprisingly large amount of direct investment.

Additional data from the International Trade Administration show that a greater-than-average number of foreign plants (relative to the employment base) in every state of the Southeast and Southwest, except for Arkansas, Oklahoma, and Arizona. At the same time, North Carolina, South Carolina, Tennessee, Virginia, and Texas stand out when we examine this index in conjunction with the states' percentage of all U.S. plants. Thus the pull of the South emerges once again from the ITA as well as Japan Economic Institute (JEI) data. The number of factories acquired or built by foreign firms heavily favored the Southeast, the region that we know is the strongest base of U.S. affiliate activity.

New plants were separated from acquisitions and mergers, using the ITA and JEI data. These figures show that new plant expansions contributed more to the economic base of the Southeast, Southwest, Far West, and New England, than to the Great Lakes and Mideast; the Great Lakes and Mideast received relatively more investment through acquisitions of existing capital. Greenfield investment is obviously preferred by local economic development policymakers since it represents a net gain in regional output.

U.S. affiliates account for a larger portion of regional high-technology employment than they do in other manufacturing industries. This is particularly true in the Southeast. Much of the investment in high-technology takes the form of new plant construction. It is also apparent that foreign investment in technology-intensive industries is not confined to regions or states known among the more technologically advanced, such as Massachusetts or California. In this respect, high-technology affiliates are akin to technical branch plants of domestic firms: foreign investment is distributed more widely across the U.S. than is domestic investment.

Despite the regional dispersion of FDIUS, most investment remains clustered in high-income urban areas. The degree of metropolitan centralization is less pronounced in the South, but even there the attraction to urban areas is strong. Apart from urbanization, access to the interstate highway system is a locational determinant of local site selection.

Regression analysis was used to test hypotheses of state and county location of foreign firms compared to domestic firms between 1974 and 1983. Explanatory variables were chosen in order to confirm or deny the role of urbanization, market accessibility, labor characteristics, technology assimilation, taxes, and other variables in the selection of states and counties for greenfield plant sites. The most important finding is that foreign investors did not merely follow the spatial adjustment pattern of domestic firms. Foreign investors were market driven, but primarily to regions where existing manufacturing activity was low in relation to demand. Although domestic manufacturing penetrated these

regions too, the range of variables that had an impact on domestic firms was greater, no doubt because the spread of organizational types and the stages of the industry life cycle are more diverse. For instance, the variables that influenced firms in senescent stages of the industry life cycle--low wages and low-technology--affected only domestic, not foreign firms in the regressions. Curiously, domestic employment growth was inhibited in states that failed to cross the development threshold, while foreign firms aggressively penetrated into these states and the isolated, underdeveloped hinterland in general. At the same time, foreign firms no longer appear strongly influenced by right-to-work laws, evidence that the previous perception that Northern labor was inflexible is no longer the case. Overall, it is apparent that foreign investors, in spite of their alien status and distant headquarters, have carved out a special niche in the periphery of the U.S. regional system.

When the decision to locate at county level was examined, regressions showed that all else equal, higher locational probabilities are associated with higher urbanization, interstate highway links, production labor, and managerial-technical labor, in that order.

Several conclusions emerge from this study. It is clear that regional markets played a significant role in the spread of both foreign and domestic jobs. Within regions, our findings tend to belie the impression often given by anecdotal stories in the business press that foreign investors have largely chosen to build plants in nonmetropolitan America and are primarily cost-driven. There is much more to location than costs. For foreign oligopolies, it appears that substate plant location is a function of urbanization, concentrations of skilled and semi-skilled production labor, innovative capacity (high proportions of managerial and technical labor), and transportation accessibility.

1. WHY FOREIGN DIRECT INVESTMENT IS IMPORTANT

Newspaper headlines tell of an important new force that is reshaping the American economy:

"Foreigners Buy America"

"Japan Increases Stake in America"

"A Nation Hooked on Foreign Funds"

"Foreign Firms Help Offset Southern Setbacks in Textiles"

"European Firms on Buying Spree in U.S."

Across this country, from Oregon to Georgia and from Texas to Minnesota, foreign companies have been building new plants and acquiring existing ones--and changing our economic landscape. These foreign multinational corporations--including Mitsubishi, Seagrams, Volkswagen, and Royal Dutch Shell--have increased their ownership in American industry by a factor of twelve in the past fifteen years. They make everything from cars to clothing and they sell everything from insurance to hamburgers; they refine oil, cultivate grapes for wine, lend money, and write advertising copy. Familiar corporate names such as A&P, Brooks Brothers, and Carnation are controlled by foreign investors. And with this wave of investment has come changes in management practices, labor relations, and technology. Not only have foreign firms provided jobs and income, but they have become actively involved in politics, culture, philanthropy, and other aspects of community life.

These investments have begun to change the way that we live and work, although we aren't always aware of their influence. An American family may live in an apartment owned by a Canadian real estate firm and buy its food from the German-owned A&P (or France's Grand Union) or clothing from a British department store (Saks Fifth Avenue, Gimbels, or Marshall Field) with cash from a Hong Kong-controlled bank (Marine Midland). They may drive to work at a Saudi-owned skyscraper in an American Motors car built by Renault[1] (Feder, 1985). Most people would be unlikely to know that the apartment building or the stores or the bank were foreign owned. Many would not care. Yet their lives are becoming more intertwined with the changing world economy because of foreign direct investment in this country.

Foreign direct investment is part of a larger set of events that have internationalized the United States' economy in the past twenty-five years. These events have been pivotal in the structural transformation of national and regional economies. Vast increases in exports and imports, international migration, and the substantial investment of American multinationals abroad have further opened our economy to foreign influences. The complex interconnections among companies with worldwide markets and production sites blur the lines between "American" and "foreign" goods. Far-flung suppliers of goods, produced

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[1]Until American Motors was bought by Chrysler in 1987.

by workers speaking different tongues, dominate many American markets. Shoes, computers, machine tools, and steel represent some of the goods that have seen great increases in imports in recent years. At the same time American goods continue to be sold abroad, although our share of world trade has shrunk. U.S. firms cling to markets in a variety of high-tech and service sectors, while losing out in capital goods and consumer products. In addition, American multinational corporations (MNCs) produce abroad in order to serve foreign markets as well as markets in this country.

Just a short time ago, discussions of "foreign investment" were about U.S. direct investment abroad (abbreviated "USDIA"), not Japanese or German investment here. As Ford, IBM, and other American giants erected plants from Spain to Singapore, the spotlight was on what Barnet and Muller (1974) called "the global reach" and what Servan-Schrieber (1969) popularized as *le defi americain* ("the American challenge"). A more permissive technology, in the form of satellite-computer communications networks and jumbo transport jets, freed MNCs to locate virtually anywhere they chose. They could control far-flung operations from central headquarters and quickly and inexpensively move goods from factory to market. Putting the technical advances into practice and flush with surplus capital, U.S. MNCs took the lead, traversing the globe in search of profitable sites (Castells, 1985). In addition, U.S. tax laws favorable to foreign investment, trade liberalization, and the predominant economic position of the U.S., spurred American firms to invest abroad. The firms have sought lower production costs, growing markets, subsidies from host countries, and the avoidance of trade sanctions (Vernon, 1986).

Not surprisingly, analyses of foreign direct investment (FDI) have focused almost exclusively on the overseas investment by American-based corporations: until recently, the U.S. was the world's largest net exporter of capital.[2] But in the last fifteen years there has been a remarkable change in the foreign direct investment picture. Although American investment abroad has continued to grow, foreign direct investment in the United States (known as FDIUS) has grown far more rapidly. A special *Business Week* report called "Japan in America" highlighted this phenomenon, saying that Japanese investment "promises to be one of the most important economic forces reshaping America as the century concludes." Moreover, *Business Week* said:

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[2]The international movement of productive capital is roughly equivalent to foreign direct investment (FDI) entries recorded in the government's international balance of payments accounts. FDI is defined as a person (firm) in one nation having a lasting interest in and influence over the management of a business enterprise in another nation. The usual measure of direct, as opposed to portfolio investment by a U.S. affiliate is ten percent or more ownership interest. This provides a crude, but consistent measure of international flows of productive capital. In accordance with official usage, we will refer to a foreign-owned subsidiary in the U.S. as a "U.S. affiliate." Stocks of foreign direct investment are commonly expressed in terms of book value. Because book value is reported as the purchase price of assets and not the current market value, it tends to underestimate the actual value of a MNCs assets. See Dicken (1982) and Robock and Simmonds (1970).

> A new wave of Japanese investment is sweeping across America. Unlike earlier commitments to coastal areas, this second wave is reaching deep into the heartland. It is spawning Japanese industrial centers such as "Auto Alley," stretching into the mid-South, and "Silicon Forest" in the Northwest. It is giving failing American companies a fresh start through infusions of capital and management. And it is providing new sources of financing to local and state governments, which were once suspicious and fearful of outsiders (Holstein, 1986; p. 45).

What *Business Week* said about Japan could also be said about the changes in the economy as a result of investments by MNCs from other nations, particularly the Netherlands, West Germany, England, France, Switzerland, and Canada. Without doubt, foreign investment in this country has become substantial in the past decade or so and has contributed importantly to the growth of the economy. The 1985 value of direct foreign investment in this country was $183 billion, fourteen times the level in 1970. In 1984,[3] foreign firms owned property, plant, and equipment with a gross book value of $268 billion and had $596 billion of total assets; foreign firms also owned 13 million acres of land and had mineral rights to an additional 63 million acres. More important, they employed 2.7 million workers (compared to 1.1 million ten years earlier), about 3 percent of all employed. The 1.4 million workers in foreign-owned manufacturing plants constituted 7 percent of all manufacturing employees. Foreign firms paid these workers relatively well: the average employee of a foreign affiliate earned $26,848, 9 percent more than the average paid by domestic firms. In addition, foreign firms accounted for $56 billion worth of exports (one-quarter of all exports), and $100 billion of imports (nearly one-third of all imports) (Shea, 1986b).

In all, more than seven thousand acquisitions, mergers, and new plant investments were made between 1979 and 1985 alone.[4] Large investments, spanning nearly every industry, have taken place by different methods. For instance, there were *de novo* or *greenfield* factories that firms start from scratch. The establishment by Nissan of a $500 million auto plant in Smyrna, Tennessee, and Toyota's investment of $800 in Georgetown, Kentucky, are examples of this type of entry into the U.S. market. Other firms enter through *acquisitions* of or *mergers* with American companies. So, the Campeau Corporation, a French-Canadian real estate firm, took over Allied Stores, owner of Brooks Brothers, Ann Taylor, and several other retail chains for $3.7 billion in 1986. The acquisition of Celanese by the German chemical giant Hoechst A.G. for $2.84 billion created

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[3]1984 is the last year for which complete data on assets, employment, sales, and other variables related to FDIUS are available.

[4]Shea (1986a) reports 7,714 new investments, mergers, and acquisitions by foreign companies between 1979 and 1985. According to more disaggregated data from the Commerce Department, there were 6,252 investments by foreigners between 1979 and 1983. Of those 11 percent were new investments; 29 percent were mergers, acquisitions, and joint ventures; 26 percent were real estate investment; and 9 percent were increases in equity and plant expansions. The remaining investments were unclassified.

one of the world's largest chemical firms in 1986. The new firm had 1985 combined sales of $17.6 billion, a billion dollars more than Dupont. France's Schlumberger bought SEDCO, a mining company, for nearly $1 billion in 1984; Australia's Broken Hill bought the mining giant Utah International for $2 billion in 1984; and Switzerland's Nestle purchased Carnation for $3 billion in 1983. Indeed, much of the value of FDIUS has come about through acquisitions, rather than greenfield investment. During 1985, about four out of every five foreign investments were acquisitions (Shea, 1986a). In some cases, investment takes the form of *increased equity* in a subsidiary already owned by a foreign parent (e.g., Royal Dutch Shell group pumped an additional $5 billion into its American operations in 1983 alone).

The growth of FDIUS has been important in reducing the loss of manufacturing jobs in this country. Between 1974 and 1984, American manufacturers cut more than 2.4 million jobs. But foreign manufactures employed 700,000 additional workers; U.S.-affiliate employment grew by 9.2 percent a year. For the economy as a whole, about one in seven new jobs created were in foreign companies during that period.[5] However, many of the new jobs created by FDIUS have been nonunionized and some have involved different job classifications, work rules, and other labor relations practices than domestic firms.

2. GENERAL ASPECTS OF U.S. AFFILIATE LOCATION

Although the following profile of inward investment is limited by the extent and integrity of its underlying data sources, recently published Bureau of Economic Analysis (BEA) series now make it possible to analyze direct investment in more detail, with greater reliability, and over a longer time span than has been previously possible.[6] BEA reports contain geographical series for five measures of U.S. affiliate activity: employment, number of firms, wages, acres of land owned, and property, plant, and equipment (PPE).[7] This study relied primarily on the employment and PPE estimates from 1974 to 1983, to gauge the

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[5]It is important to understand that jobs attributed to foreign firms are not necessarily new ones. In some cases, such as acquisitions, there has simply been a transfer of assets from a domestic to foreign owner, with no change in production or employment.

[6]The BEA was authorized by Congress to collect a wide range of information from every affiliate of foreign-owned corporations operating in the U.S., beginning with the 1974 *Benchmark Survey of Foreign Direct Investment.* In addition to undertaking the 1974 study of U.S. affiliates and a subsequent benchmark in 1980, the BEA began a series of survey estimates based on the benchmarks in 1977.

[7]PPE (property, plant, and equipment) is the gross book value of fixed assets owned by U.S. affiliates measured at historical cost.

patterns of FDIUS among regions and states and to test locational factors.[8] While other data sources lack the complete coverage contained in the BEA's U.S. affiliate files, disclosure rules prevent the agency from publishing detailed information from its confidential records of private foreign activity. Therefore, the figures found in published BEA reports are highly aggregated. For example, we were limited to analyzing manufacturing trends by state, rather than by a finer industrial and geographical classification level as is often preferred in locational studies. Still, these data enable us to examine the regional dimensions of FDIUS in more depth and with greater accuracy than was possible in previous work.

2.1 Source Country Patterns

Before focusing on affiliate manufacturing, we will examine how these aggregate FDIUS figures were distributed among different investor countries. The headquarters of foreign corporations owning U.S. affiliates are found almost exclusively in the world's most advanced industrial nations, where competitive advantages over U.S. corporations are nurtured through sophisticated, high-income markets, economies of scale, and technological innovation. Only by internalizing these advantages can foreign corporations establish a productive base in the U.S. without succumbing to competition from domestic corporations. In essence, these firms tend to be mature oligopolies, primarily driven to extend market share in other parts of the developed world.[9]

European and Canadian firms account for the greatest share of total inward investment. According to BEA employment data for 1983, the United Kingdom ranked first as ultimate beneficial owner (UBO) in every region[10] except the Plains and the Southwest, where it ranked second.[11] Canadian firms rank first in the Plains and Southwest; second in New England, the Mideast, the Great Lakes, the Rocky Mountains, and the Southeast; and fourth in the Far West. Germany is the next major source of FDIUS, followed by the Netherlands,

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[8]This time period was chosen because it represents the longest one available. It should be recognized that 1974 marked the beginning and 1983 the end of a major recession. We would have preferred to make peak-to-peak comparisons but could not do so.

[9]This statement is not merely our assertion; rather, it is in line with over two decades of research on the nature of the multinational corporation. For a review of this literature, see Agarwal (1980), and Caivet (1981). Arpan et al. (1981) is a good summary of research on FDIUS.

[10]The regional breakdown used in this study follows the BEA classification scheme. To pinpoint the "ultimate beneficial owner" the BEA followed the ownership chain of investment back to the "person" (usually a business enterprise) that is not owned by more than 50 percent by another person. See U.S. Department of Commerce, Bureau of Economic Analysis (1983).

[11]A summary of the latest regional data by source country is provided in an unpublished report obtained from the BEA (Coleman, 1985). Comparable figures for manufacturing employment by UBO are not provided in this or other BEA reports.

France, Switzerland, and Japan--except in the Far West, where Japan has the second largest amount of total employment.

At first the spatial distribution of total FDIUS appears to be more or less what we would expect: states receiving the highest percentages of total employment are those that also have large concentrations of domestic population and employment. Figure 1 shows the four industrial states that received the most employment from inward investment in absolute terms, highlighted by source nation. The largest shares of European and Canadian employment are found in New York, Pennsylvania, Texas, and California, although no state commands more than 9 percent of the total. Only Japanese firms exhibit a more skewed distributional pattern, with almost 30 percent of U.S. affiliate employment concentrated in California, followed by New York, Illinois, and Texas with 8, 7, and 5 percent, respectively.

But regional or state employment shares in themselves represent only one of many perspectives from which we can view FDIUS. In order to uncover some of the peculiarities in the location of foreign firms, a state attractiveness index, or *location quotient*, was calculated for Canadian, European, and Japanese investment. Each state's share of U.S. affiliate employment was divided by its share of domestic employment,[12] or

$$(1)\ LQ_i = (FEMP_i / \sum_{i=1}^{48} FEMP_i)/(DEMP_i / \sum_{i=1}^{48} DEMP_i)$$

where LQ_i is the location quotient for state i, $FEMP_i$ is total foreign employment, and $DEMP_i$ is total domestic employment. Location quotient values greater than one indicate greater relative shares of foreign-owned firm employment over domestic-owned firm employment in a state.

Figure 2 shows that European investors have been more attracted to certain East Coast and southern states compared with domestic firms. Significantly high location quotients (greater than 1.50) are spread out along the eastern seaboard: South Carolina (2.07), New Jersey (1.80), Maine (1.56), and North Carolina (1.56). Canadian *LQ's* depicted in figure 3 are more widely dispersed and encompass a border orientation, a preference for southern states, some attraction to a number of interior states. The Canadian location quotients are especially strong in West Virginia (5.64), Maine (4.10), Vermont (2.16), North Carolina (1.80), and Iowa (1.52). Location quotients for Japanese investment in figure 4 reveal a much more compact geographical distribution, with a pronounced West Coast bias for California (2.95). Other states decidedly favored by the Japanese are New Jersey (2.18), Tennessee (1.87), and Washington (1.60).

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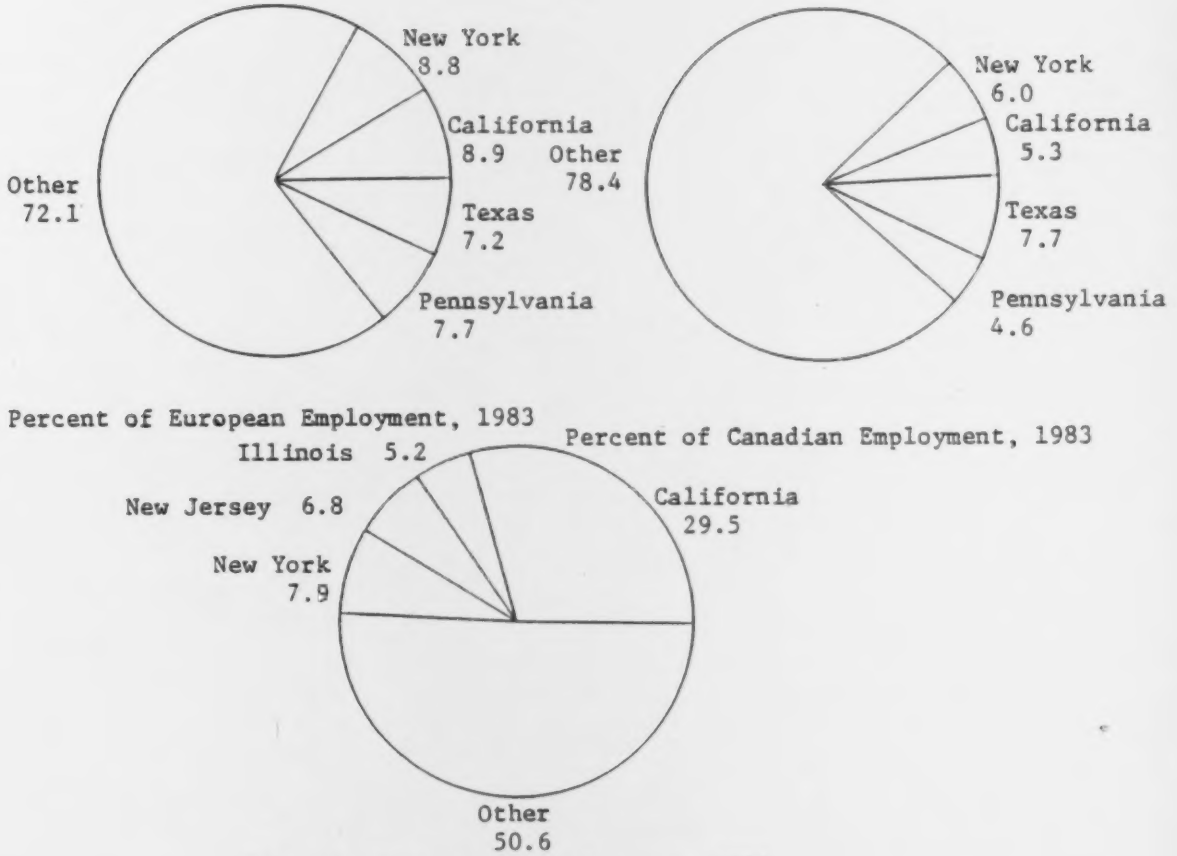
[12]Domestic employment data for 1974 and 1983 used here are based on the total U.S. manufacturing employment figures found in the U.S. Department of Labor, Bureau of Labor Statistics (1985). To obtain "domestic" employment, U.S. affiliate employment was subtracted from the Department of Labor data.

Figure 1

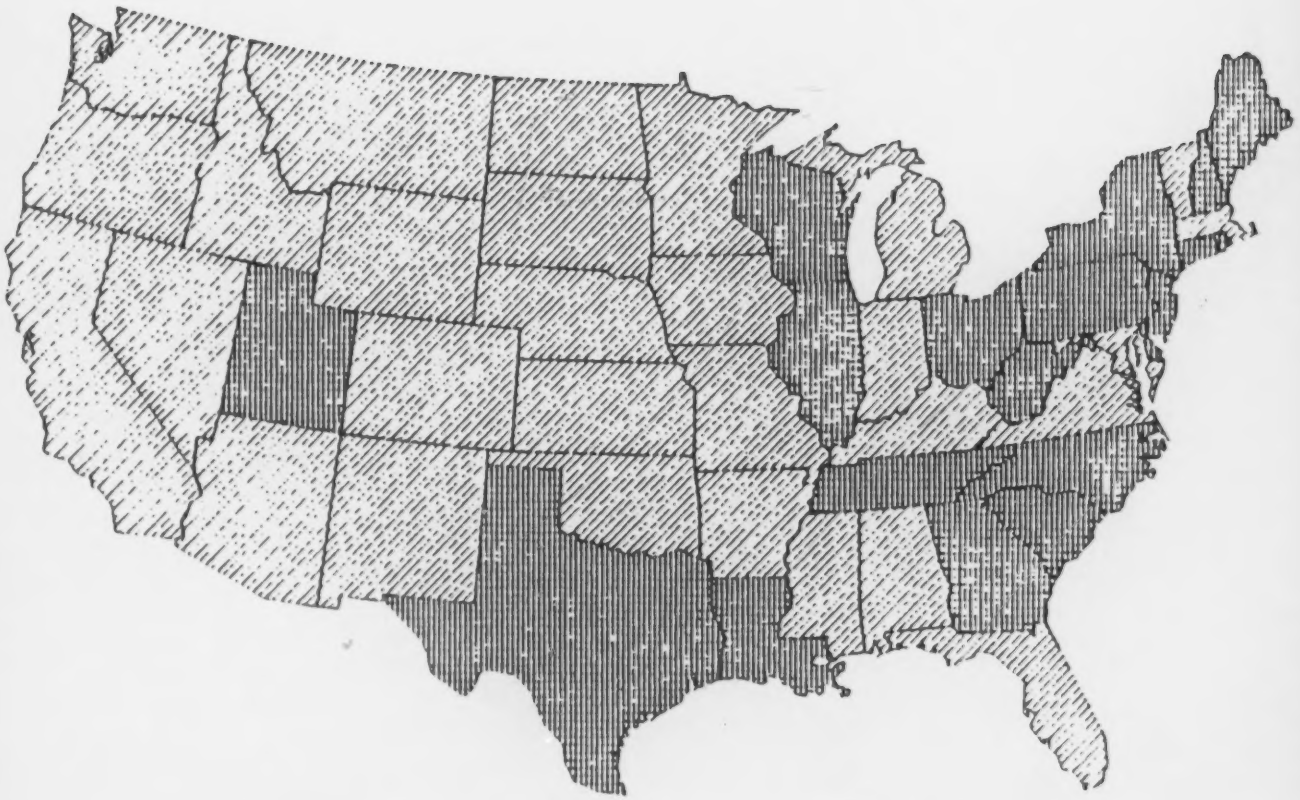
Principal Beneficiary States,
Percent of Total FDIUS Employment,
by Investor Country, 1983



Data Source: Coleman (1985)

Figure 2

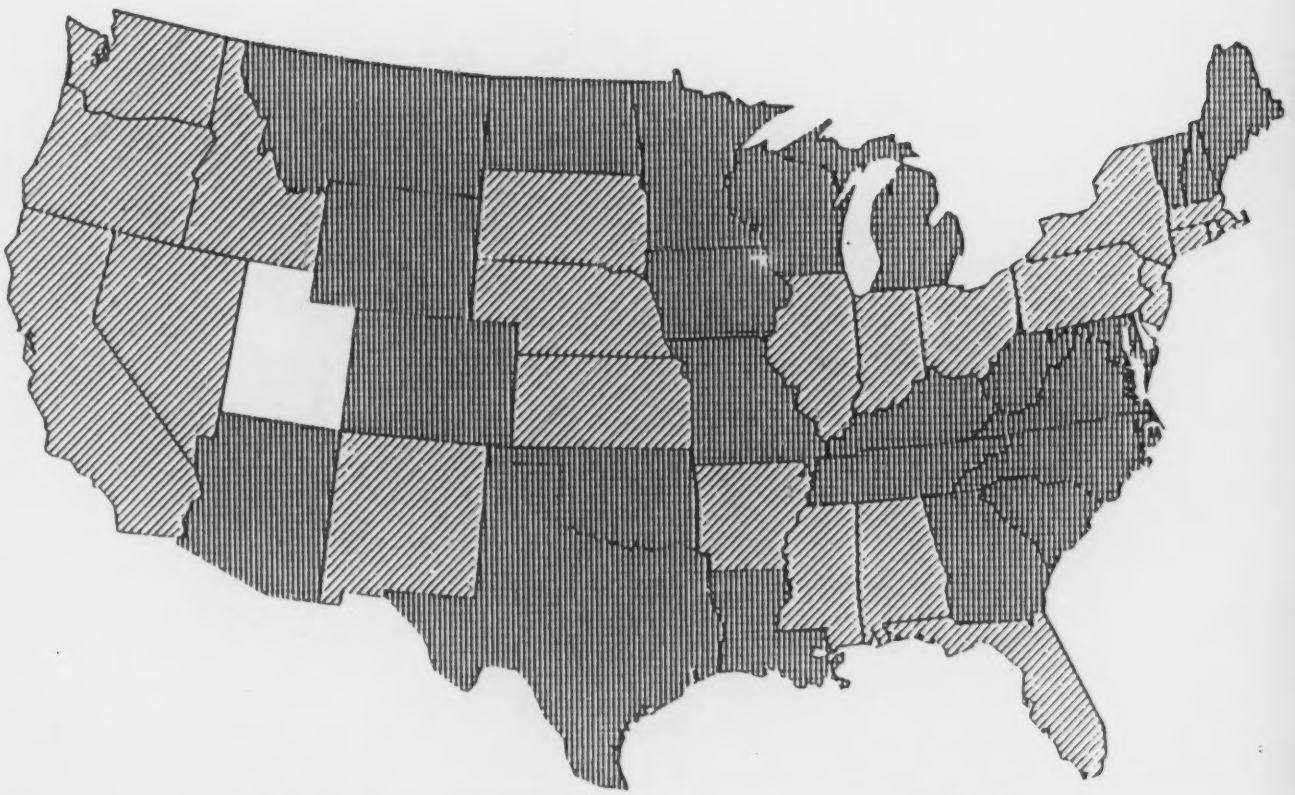
Location Quotients for European Investment, 1983



DATA SOURCES: COLEMAN (1983);
U.S. BUREAU OF LABOR STATISTICS (1985)

Figure 3

Location Quotients for Canadian Investment, 1983



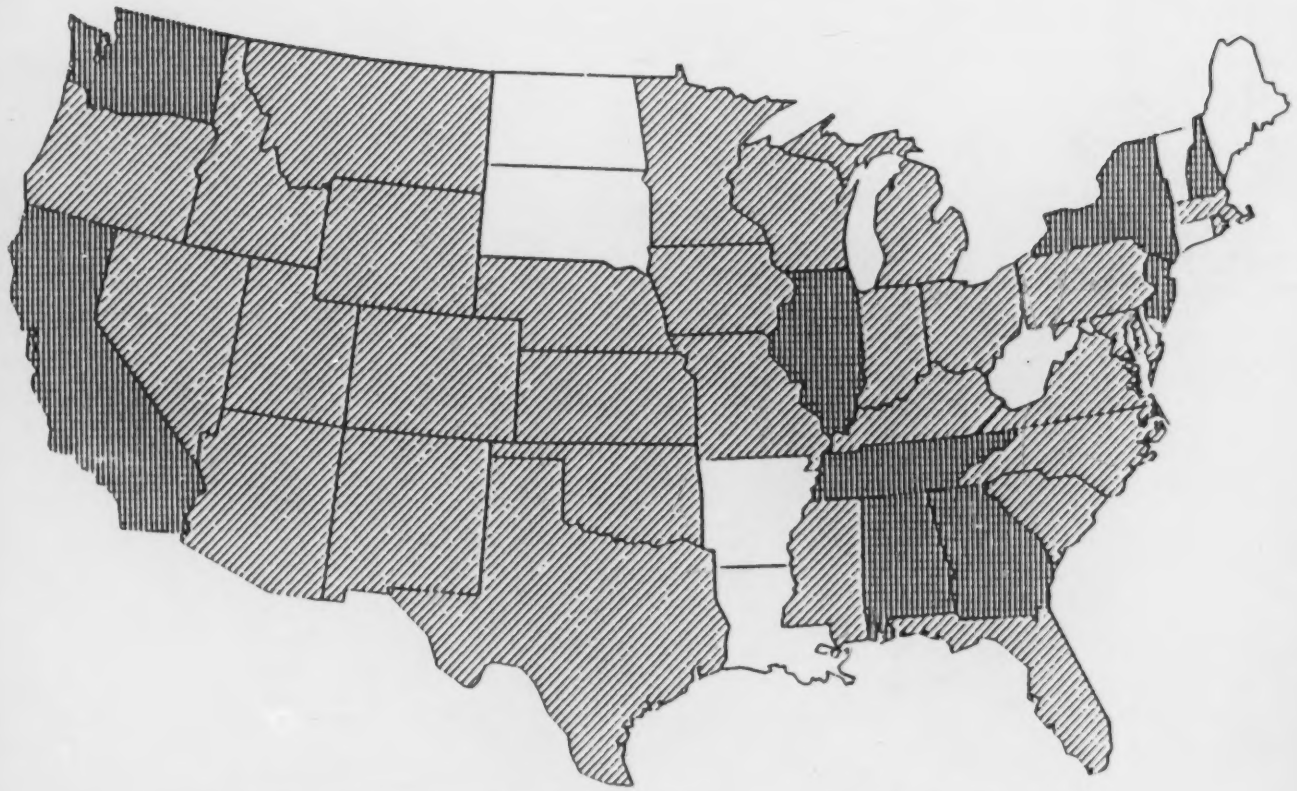
LEGEND: QUOTIENT LESS THAN 1 GREATER THAN 1

NOTE: DATA NOT AVAILABLE FOR BLANK STATES

DATA SOURCES: COLEMAN (1983);
U.S. BUREAU OF LABOR STATISTICS (1985)

Figure 4

Location Quotients for Japanese Investment, 1983



NOTE: DATA NOT AVAILABLE FOR BLANK STATES

DATA SOURCES: COLEMAN (1983);
U.S. BUREAU OF LABOR STATISTICS (1985)

2.2 Trends in the Location of Total FDIUS

Location quotients measure the degree of spatial integration between foreign and domestic employment at a given time. We can detect *trends* in spatial attraction by comparing differences in regional employment shares in 1974 and 1983. These are displayed for total FDIUS (from all industrial sources) in table 1. Employment shares in the Manufacturing Belt (the Mideast and Great Lakes) declined between 1974 and 1983; all other regions, notably the Southeast and Southwest, gained. In fact, by 1983 the Southeast surpassed the Mideast as the region with the largest total U.S. affiliate employment and, by definition, the largest employment share.

We can acquire a deeper appreciation of recent trends by looking at the average annual growth rates in table 1. Indicating a recent movement of U.S. affiliates into interior regions, the fastest 1974-1983 average annual growth rates for foreign employment were found in the Southwest (16.1 percent) and Rocky Mountains (13.9 percent). The Mideast and Great Lakes experienced below-average growth and hence suffered declining shares of total employment. Despite the comparatively high growth rates in the interior (the Plains, Rocky Mountains, and Southwest), these regions remained low in terms of shares of FDIUS employment. Low regional shares in the interior are the consequence of the relatively few states included in these BEA regions and the regions' initially low levels of U.S. affiliate activity. Still, rapid growth outside the Manufacturing Belt regions, a phenomenon of the latest wave of inward investment, means that a more even spatial distribution of jobs is taking shape. This westward spread of employment is in part offset by slightly-above-average growth in New England.

We noted a related movement of capital away from the Manufacturing Belt in an earlier inspection of growth rates for total property, plant, and equipment (PPE) between 1974 and 1981 (Glickman and Woodward, 1985). Figure 5 vividly illustrates that PPE growth in the South and West overshadowed the otherwise high average annual growth in the northern regions. PPE, which captured the capital-intensity of FDIUS, was expanding most rapidly in the Southwest and Rocky Mountains. These regions also had the greatest employment growth. Hence, as FDIUS surged at a rate of growth far beyond that of domestic investment, FDIUS was spreading the benefits of jobs and capital to more dispersed locations.

The data examined so far combine all industrial sources of FDIUS--wholesale and retail trade, real estate, finance, insurance, petroleum, mining, and manufacturing industries. Actually, manufacturing predominates over all other industrial sources, even as the U.S. moves toward a more service-based economy. Manufacturing accounted for slightly more than one-half of total FDIUS employment in 1983, about the same as in 1974, and contributed to over one-third of total PPE. Petroleum is the only other major industrial source of FDIUS that may have a significant effect on regional development. Accounting for only about 5 percent of employment (but almost 30 percent of PPE), foreign-owned petroleum affiliates are highly concentrated in three states--Texas, Louisiana, and California. Manufacturing affiliates are more spread among regions and states, as we will see in the next section.

Table 1

Regional Distribution of Total Foreign Employment, 1974 and 1983

Region	1974 Employment	Share	1983 Employment	Share	Average Annual Growth Rate (%)
New England	67141	6.0	159924	6.4	10.1
Mideast	333867	29.7	561955	22.6	6.0
Great Lakes	232179	20.6	425286	17.1	7.0
Plains	45351	4.0	111758	4.5	10.5
Southeast	235588	20.9	615150	24.8	11.3
Southwest	66725	5.9	255650	10.3	16.1
Rocky Mountains	17022	1.5	54975	2.2	13.9
Far West	128091	11.4	301049	12.1	10.0
Total	1125964	100.0	2485747	100.0	9.2

Note: Because the figures are rounded, regional shares will not add up precisely to 100 percent.

Data Source: Coleman (1985)

Table 2

Regional Breakdown of Foreign Manufacturing Employment, 1974 and 1983

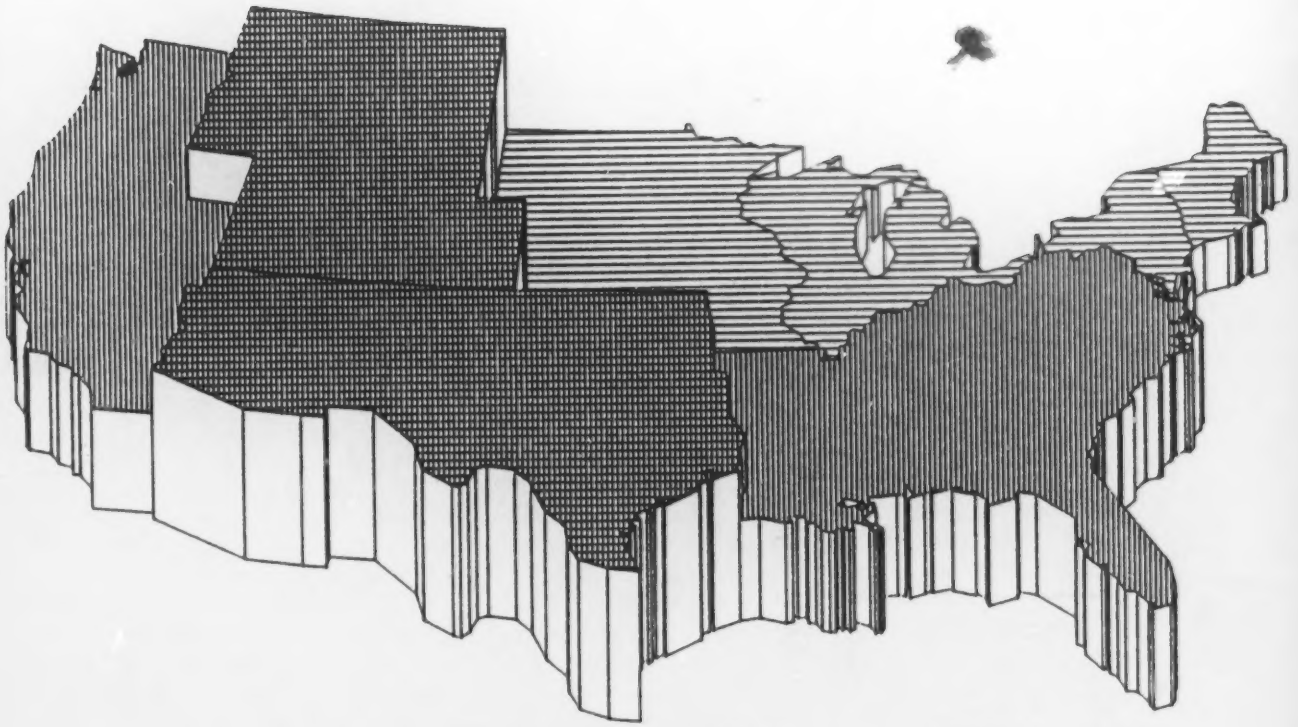
Region	1974 Employment	Share	1983 Employment	Share	Average Annual Growth Rate (%)
New England	41955	7.2	86901	6.7	8.4
Mideast	149480	25.6	298313	23.2	8.0
Great Lakes	121249	20.7	242105	18.8	8.0
Plains	21812	3.7	61486	4.8	12.2
Southeast	167330	28.6	335424	26.0	8.0
Southwest	19080	3.3	103037	8.0	20.6
Rocky Mountains	6682	1.1	24392	1.9	15.5
Far West	57574	9.8	137769	10.7	10.2
Total	585162	100.0	1289427	100.0	9.2

Note: Because the figures are rounded, regional shares will not add up precisely to 100 percent.

Data Source: Coleman (1985)

Figure 5

Average Annual Growth Rates
of Foreign PPE, 1974-1981



REGIONAL GROWTH RATES (SEE TABLE 1)

DATA SOURCES: U.S. DEPARTMENT OF COMMERCE (1976),
HOMENSTINE (1983)

3. REGIONAL PATTERNS OF MANUFACTURING FDIUS

3.1 Manufacturing Composition

A detailed inspection of U.S. affiliates' manufacturing (or factory) location is necessary, since manufacturing is the largest single industrial component of FDIUS and is now significant enough to have an effect on regional development. The growth of manufacturing FDIUS contrasts strongly with the decline of domestic manufacturing between the early 1970s and the mid-1980s. Foreign manufacturing jobs reached 1.3 million in 1983, about 7 percent of the manufacturing employment in the mainland U.S.

We first examined the 1983 industrial composition of FDIUS by region in order to show the position that factory employment holds relative to other industrial sources.[13] Although factory employment as a percentage of total employment remained constant between 1974 and 1983 at about 52 percent, the percentage breakdown by region changed during the period. The manufacturing share of total FDIUS contracted in New England (from 62 percent to 54 percent) and the Southeast (from 71 percent to 54 percent), remained roughly constant at 45 percent in the Far West, and increased in all other regions. One-half of all states experienced lower manufacturing employment relative to total employment. Declining factory employment in relation to other industrial sources is sometimes used to convey a sense of atrophy and "deindustrialization" in American industry. However, with foreign manufacturing employment rising in every region and state, the lower share of manufacturing employment reflects the growing importance of trade and services in areas where manufacturing was originally quite high. In fact, this rise in factory employment across all regions runs contrary to the *absolute decline of domestic manufacturing* during the 1974-83 period, which is a far more serious indication of deindustrialization. We will return to the deindustrialization phenomenon shortly.

3.2 Concentration and Dispersion Across Regions

Consider next how regional FDIUS employment is spatially distributed within the manufacturing sector. Employment levels, percentage shares, and average compounded growth rates for U.S. affiliate manufacturing industries in 1974 and 1983 are summarized in table 2. The top three regions remained in the same position for both years in terms of manufacturing employment shares. They are, in order, the Southeast, the Mideast, and the Great Lakes. This contrasts with total FDIUS employment data aggregated over trade, services, manufacturing, and all other industrial sources given in table 1, where we found that the Mideast received the greatest share of total employment in 1974, the Southeast was second, and the Great Lakes was not far behind. Because the Southeast's service and trade base grew, that region took first place in terms of total employment shares by 1983. In table 2 we see that the Southeast was the strongest manufacturing base even in 1974, gained more jobs than any other region between 1974 and 1983, and therefore remained the hub of manufacturing

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[13]The discussion here is based on tables found in Coleman (1985). An overview of the industrial composition of foreign property, plant, and equipment is provided in Glickman and Woodward (1985).

activity. Table 2 also illustrates that the relative position of each region's manufacturing share remained unchanged during the period, with one exception: the Southwest surpassed the Plains after the Southwest's share more than doubled from 3.3 percent to 8.0 percent. The Southwest also exhibited the highest average annual compounded growth rate during the period; other regions with growth rates higher than the U.S. average are the Rocky Mountains, the Plains, and the Far West. Of course, growth rates should be higher in regions such as the Southwest where the initial employment base is low.

Perhaps the Southeast leads the nation in employment by virtue of its relative advantage in labor-intensive industries. If that is the case, then what about the amount of invested capital? PPE is the only measure of U.S. affiliate capital stock released by the BEA. State shares and average annual growth rates were calculated for manufacturing PPE and are summarized in table 3. In 1974 the Southeast was even further ahead in manufacturing capital than employment, with about 40 percent of the total. Once more, the Mideast's share was second and the Great Lakes' third. And again, the annual growth rates for the three leading regions were below the U.S. average of 23.4 percent,[14] although in total size and share they remained in the same relative position in 1983. The Southwest, the fastest growing region in terms of employment, experienced an even more astonishing rate of PPE growth between 1974 and 1983. The region's PPE share was not only the lowest in 1974, but it was virtually negligible; however, with annual growth of 88 percent it moved to fourth place by 1983. Much of the investment in the Southwest is attributable to Texas, which enjoyed a surge in PPE, notably in the chemicals sector.[15] Above-average growth also bolstered the foreign capital stock of the Plains, Rocky Mountains, Far West, and New England regions.

3.3 Per Capita Foreign Manufacturing Activity

The figures presented so far were not adjusted for the size of regions and states. Therefore, the figures may conceal the real strength of FDIUS in certain geographic areas. Ranking employment and PPE shares by region, for instance, may naively overstate the relative position of the Southeast, because it includes more states than any other BEA region. To get a better sense of where clusters of foreign investment are found, state manufacturing employment and PPE were adjusted by population size.

The figures for affiliate employment and PPE were taken from the 1980 benchmark study (U.S. Department of Commerce, Bureau of Economic Analysis, 1983) and used to construct an index of per capita foreign activity in the U.S. Because of population growth in the South and West, per capita affiliate employment and PPE are not useful indicators of dispersion, or changes in foreign

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[14]The high growth rate of PPE (23.4 percent versus 9.2 percent for employment) is partly an inflationary phenomenon. We assume that inflation is more or less the same across regions.

[15]The chemicals and allied products sector is the largest source of manufacturing FDIUS. Other states with significant PPE in chemicals are New Jersey, Louisiana, and South Carolina.

Table 3

Regional Breakdown of Foreign Manufacturing PPE, 1974 and 1983
(Millions of Dollars)

Region	1974 PPE	Share	1983 PPE	Share	Growth Rate
New England	546	4.16	4310	4.93	25.81
Mideast	3380	25.75	15238	17.42	18.21
Great Lakes	2228	16.97	11172	12.77	19.62
Plains	734	5.59	3928	4.49	20.49
Southeast	5201	39.62	28310	32.37	20.72
Southwest	51	0.39	15075	17.24	88.16
Rocky Mountains	55	0.42	1902	2.17	48.25
Far West	932	7.10	7527	8.61	26.12
Total	13127	100.00	87462	100.00	23.46

Data Source: U.S. Department of Commerce, Bureau of Economic Analysis (1976; 1985a)

Table 4

Index of Per Capita Foreign Manufacturing Employment and PPE, 1980

Region	1980 Per Capita Employment Index*	1980 Per Capita PPE Index*
New England	120.32	91.37
Mideast	123.11	95.20
Great Lakes	111.76	87.33
Plains	75.66	66.97
Southeast	96.39	141.11
Southwest	72.39	128.93
Rocky Mountains	61.40	42.77
Far West	91.88	67.86

* Note: This index is regional per capita affiliate employment (PPE) relative to the U.S. average per capita affiliate employment (PPE), multiplied by 100.

Data Sources: U.S. Department of Commerce, Bureau of Economic Analysis (1983); U.S. Bureau of the Census (1985b)

activity over time. But they do provide measures of the concentration of foreign activity relative to the size of the regions at a given time. Regional indices for per capita employment were calculated by first dividing regional manufacturing employment and PPE by each region's total population, expressing the result relative to the average employment per head for all regions, and finally multiplying this ratio by 100. Algebraically, this index is:

(2) $\{(FEMP_i/POP_i) / (FEMP_i/POP_i)\} \times 100$

where $FEMP_i$ and POP_i are foreign manufacturing employment and population, respectively, in region *i* for 1980. Likewise, an index was created for per capita property, plant, and equipment.

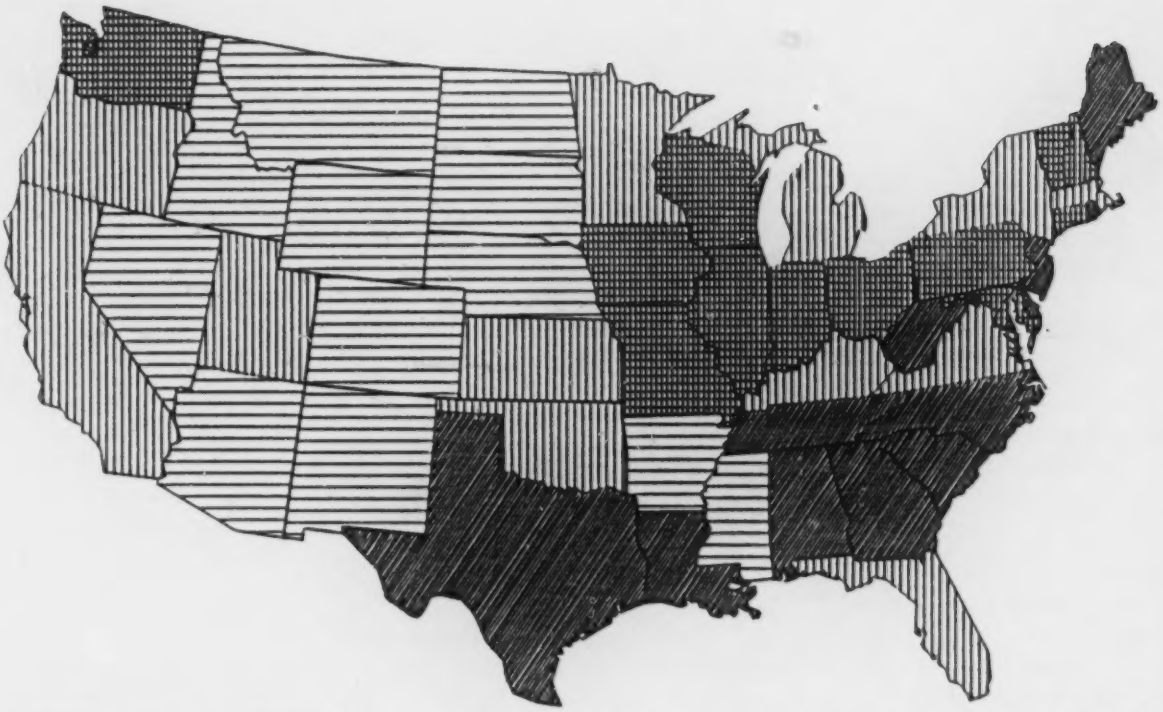
Table 4 shows that eastern regions (the Mideast and New England) dominated the per capita employment index in 1980. Actually, it is not surprising that eastern Manufacturing Belt states (and New England's border states) were strong, especially given the inclusion of acquisitions in the data. If it were possible to separate acquisitions from these data, we would expect the South to be stronger: the South has more of its investment in start-ups relative to the Manufacturing Belt. The Great Lakes' per capita employment was above the national average in 1980, while all other regions were below average. The strength of the South is brought to light in the per capita PPE index of table 4: only the Southeast and Southwest were above average in 1980. These per capita property, plant, and equipment figures demonstrate that the strength of the South is *not* primarily a matter of employment, or labor intensity. Figure 6 shows the distribution of per capita PPE for 1980. Here we find that the upper quartile of PPE per capita was dominated by southeastern states, along with Texas in the Southwest. Also in the upper quartile was a set of East Coast states including Maine on the Canadian border. The inland Manufacturing Belt states, along with a number of other coastal and northern border states, fall into the next highest quartile.

3.4 Foreign Versus Domestic Manufacturing Patterns

As foreign manufacturing investment in the U.S. expanded, domestic manufacturing languished. U.S. affiliate employment grew at an average compounded rate of 9.2 percent, while domestic manufacturing employment declined. Woodward (1986; chapter 1) observed that the deterioration of U.S. manufacturing during the 1974-1983 period is commonly believed to be a consequence of the rising value of the dollar during the latter half of the period and the deep 1980-1982 recession. These absolute job losses were spread unevenly among regions. Forced to adjust to stagflation and increasing foreign competition, domestic firms spurned their traditional affinity for the "heartland" states of the Great Lakes and Mideast regions, leaving many communities with abandoned and underutilized factories. Even the industrialization of the Southeast faltered as its base of low-wage manufacturing employment was eroded by cheap imports. At the same time, demographic and market-driven investment helped shield western regions from absolute decline. And in one of the most dramatic regional transformations of the century, a technology-driven industrial expansion revitalized the economic structure of New England. The region's manufacturing employment emerged from the recession of the early 1980s in much better shape than it was in after the recession of the mid-1970s.

Figure 6

The Location of Property, Plant, and
Equipment for Manufacturing FDIUS by State, 1980



NOTE: LEVEL = PER CAPITA PROPERTY, PLANT, AND EQUIPMENT (BY QUARTILE)

DATA: U.S. DEPARTMENT OF COMMERCE (1983)

Clearly, both domestic and U.S. affiliate regional patterns are in flux. How different are the changing spatial patterns of domestic and foreign manufacturing? Are domestic and foreign firm patterns converging as they reshape U.S. industrial geography? Consider first how *domestic* employment and capital stock per-capita differ from the *foreign* per-capita figures presented in table 4.[16] Comparing tables 4 and 5 brings out major differences between foreign and domestic per capita employment. The Mideast ranked first in 1980 foreign per capita employment, but the region was below both New England and the Great Lakes in domestic per capita employment. The foreign and domestic employment indices for the Southeast and Southwest are quite close to one another, yet their per capita foreign PPE indices in table 4 are substantially higher than the domestic gross fixed assets indices shown in table 5. The Great Lakes, not the South, led all other regions in *domestic* per capita capital stock.

Employment shares can serve as a basis for comparing changes in foreign and domestic manufacturing in regions over time.[17] The 1974 and 1983 regional share figures displayed in table 6 demonstrate that the combined processes of regional restructuring and deindustrialization adversely affected the economic fortunes of the Manufacturing Belt during the period. Although the Great Lakes had the largest share of manufacturing employment in 1974, the Southeast moved ahead by 1983. And, even though domestic manufacturing employment in the Southeast actually rose by about 206,000 jobs, this pales in comparison with employment declines in the Mideast and Great Lakes, which lost 954,000 and 1,320,000 jobs, respectively. The Southeast therefore experienced an increase in its share. This repositioning of the Southeast vis-a-vis the Great Lakes between 1974 and 1983 brings it into line with the U.S. affiliate pattern established before 1974. Still, the Great Lakes remained a stronger base for domestic manufacturers than for foreign producers. The foreign producers preferred the Southeast (see table 2); the Mideast placed second. In other words, foreign employment is more concentrated in the eastern half of the Manufacturing Belt than domestic employment.

Table 6 also provides evidence on how different New England was from other Manufacturing Belt regions: its domestic employment grew and its employment share increased as the region experienced a resurgence in manufacturing activity. Recall that New England's share of U.S. affiliate jobs decreased (table 2). We might surmise that regional "human capital" advantages were not as apparent abroad as they were at home. But it is likely that the difference results from higher U.S. affiliate growth in the West and greater indigenous entrepreneurial activity in New England than in other regions. Finally, table 6 gives a summary of the relative strength of foreign employment shares through regional location quotients (foreign divided by domestic employment shares in 1983). The last column in the table shows that the Mideast had a location

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[16]The 1978 gross fixed assets series for states found in the *Annual Survey of Manufactures, 1978-1979* are the domestic data that most closely mirror the property, plant, and equipment data for U.S. affiliates. The gross fixed assets series was not published after 1978.

[17]Since domestic figures comparable to foreign PPE were not available after 1978, we could not compare changes in capital stock between 1974 and 1983

Table 5

Index of Per Capita Domestic Manufacturing Employment, 1980 and Domestic Gross Fixed Assets, 1978

Region	1980 Per Capita Employment Index*	1978 Per Capita Gross Fixed Assets Index*
New England	136.54	88.33
Mideast	102.68	94.38
Great Lakes	124.34	143.34
Plains	88.92	74.52
Southeast	94.61	74.52
Southwest	74.70	104.43
Rocky Mountains	60.00	64.68
Far West	90.32	71.40

* Note: This index is regional per capita employment (gross fixed assets) relative to the U.S. average per capita employment (gross fixed assets), multiplied by 100.

Data Sources: U.S. Department of Labor, Bureau of Labor Statistics (1985); U.S. Bureau of the Census (1979; 1985b)

Table 6

Regional Breakdown of Domestic Manufacturing Employment, 1974 and 1983 and 1983 Foreign/Domestic Location Quotients

Region	1974 Employment	Share	1983 Employment	Share	1983 Location Quotient
New England	1196.4	7.2	1323.2	7.8	0.859
Mideast	4041.0	20.8	3087.3	18.1	1.282
Great Lakes	5037.8	25.9	3716.6	21.8	0.862
Plains	1318.6	6.8	1173.4	6.9	0.696
Southeast	4116.2	21.4	3910.4	23.0	1.130
Southwest	1111.5	5.7	1214.4	7.1	1.127
Rocky Mountains	291.2	1.5	320.6	1.8	1.056
Far West	2099.2	10.8	2272.1	13.3	0.805
Total	19461.9	100.0	17018.0	100.0	

Note: Employment in thousands. Because the figures are rounded, regional shares will not add up precisely to 100 percent.

Data Source: U.S. Depatment of Labor, Bureau of Labor Statistics (1985)

quotient greater than one. Such was also the case in the Southeast, Southwest, and to a lesser extent, the Rocky Mountains region. New England, the Great Lakes, the Plains, and the Far West received lower shares of foreign employment than domestic employment.

But the state distribution of FDIUS and domestic manufacturing is becoming more balanced. The relative dispersal of both foreign and domestic activity can be seen through respective changes in the coefficient of variation (the standard deviation divided by the mean) of state employment shares. The coefficient of variation for U.S. affiliate employment shares decreased from 116.5 to 101.0 between 1974 and 1983 and from 108.5 to 105.8 for domestic shares. The spread of shares among states was greater in foreign than in domestic employment in 1974, but less in 1983. In other words, U.S. affiliates have moved toward a more even geographical dispersion.

The degree of convergence in spatial patterns was tested by examining the variance of domestic and foreign manufacturing shares in 1974 and 1983. For both years, state shares of domestic employment were subtracted from state shares of U.S. affiliate employment (*SHDIFF*), or

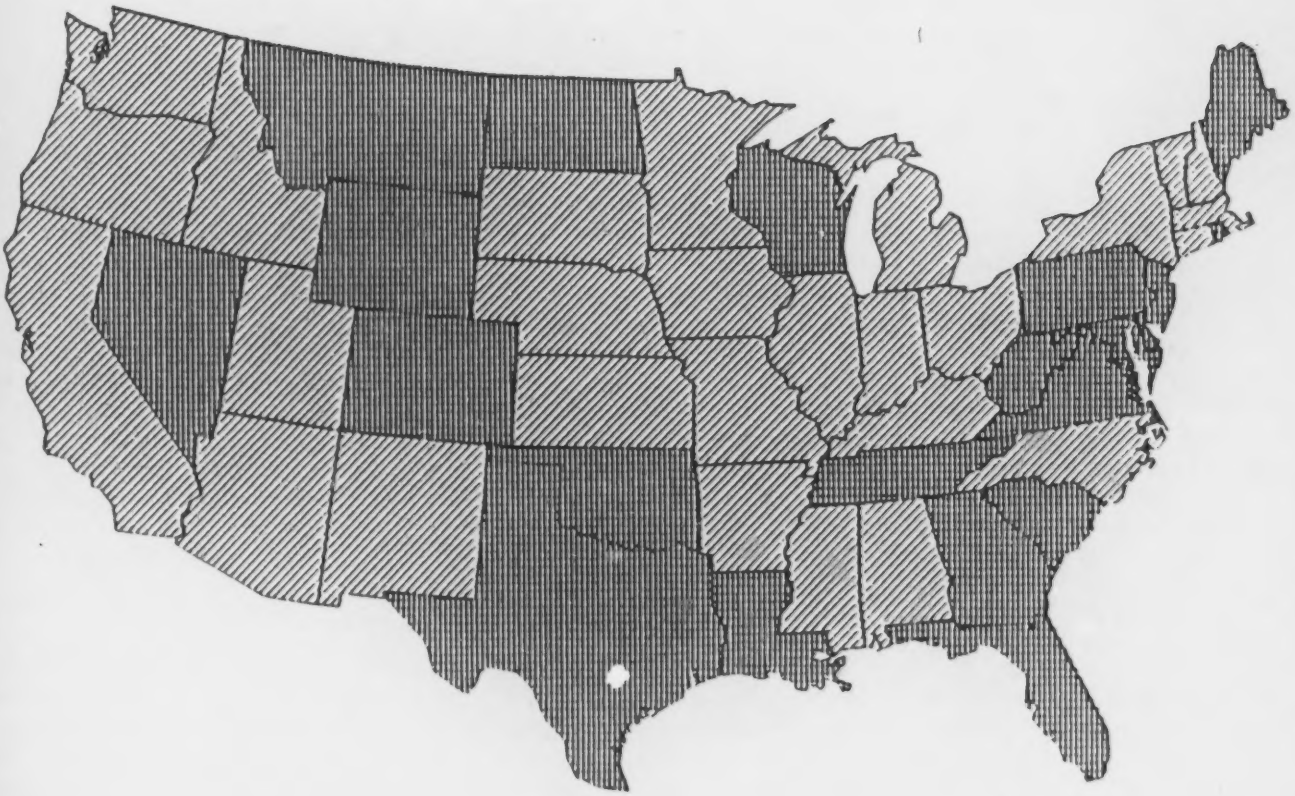
$$(3)\ SHDIFF = \left(FMEMP_t / \sum_{i=1}^{48} FMEMP_t\right) - \left(DMEMP_t / \sum_{i=1}^{48} DMEMP_t\right)$$

where $FMEMP_t$ is foreign manufacturing employment, $DMEMP_t$ is domestic manufacturing employment, and t stands for the years 1974 and 1983. The variance in *SHDIFF* decreased from 0.00015 to 0.00006 between 1974 and 1983. An F-test performed on the two variances shows that this decrease is statistically significant from zero at the 1 percent level. Since state distributions of manufacturing are moving closer together through time, we might conclude either that the spatial distribution of U.S. affiliates increasingly resembles the spatial distribution of domestic firms, or vice versa. In fact both convergence processes may be at work simultaneously. U.S. affiliate employment is apparently dispersing from a base in the East (including the Southeast and the eastern Manufacturing Belt) and from the border, while domestic employment is dispersing from the Manufacturing Belt (especially Great Lakes). Foreign and domestic employment patterns are becoming more alike but not necessarily because domestic investment follows foreign investment or vice versa, as suggested by previous studies (McConnell, 1980; O hUallachain, 1985).

State location quotients provide a summary measure of where the significant differences in manufacturing shares remained in 1983. Figure 7 divides the 48 contiguous states into those that have greater or lesser shares of manufacturing FDIUS, depending on whether the location quotient is above or below unity. The map again indicates a strong foreign preference for the eastern, southern, and Canadian border states. Some of the most significant states (where the index was greater than 1.5) were also well above one in 1974: Maine

Figure 7

Location Quotients for Foreign-Affliate
Manufacturing Employment, 1983



LEGEND: QUOTIENT LESS THAN 1 GREATER THAN 1

DATA SOURCES: COLEMAN (1983);
U.S. BUREAU OF LABOR STATISTICS (1985)

on the Canadian border and Maryland and Delaware on the East Coast.[18] Within the Southeast, Louisiana and West Virginia have high location quotients. South Carolina, an early center of foreign manufacturing, remained relatively attractive in 1983, yet less so than in 1974 compared with other states in the South. Moving westward, we find that no interior state had a location quotient greater than one in 1974, but by 1983 North Dakota, on the Canadian border, registered a substantial increase in its share of foreign employment in relation to domestic employment. Wyoming and Montana increased dramatically as well, from near zero to greater than one. Location quotients for the Southwestern states also rose substantially between 1974 and 1983, although the Arizona and New Mexico shares of foreign employment remained lower than their shares of domestic employment.

3.5 Summary

The regional profile of FDIUS so far shows that eastern and northern regions, close to the principal sources of FDIUS and blessed with large markets, historically have received a considerable share of manufacturing investment. When the U.S. affiliate PPE figures are adjusted for population size or measured relative to domestic economic activity, we find a distinct preference for southern states. A reading of industrial location studies could lead one to postulate that this "southern scenario" is determined by any or all of a number of locational characteristics: markets, low taxes, labor availability, labor cost, an aversion to cold weather, and so forth. We suspect that a staunch anti-union labor climate is fundamental in explaining the deep penetration of FDIUS in the South.

The contribution of foreign firms to the industrialization in the South is perhaps the most notable of all the subplots in the drama of inward investment. Yet we also find affiliates moving westward. The center of U.S. population has continually shifted toward the Pacific throughout this century, but foreign manufacturing firms are only now regrouping away from southern and eastern locations. Perhaps they are doing so to capture a larger share of growing regional markets. In general, foreign and domestic patterns are moving together through time, as investment spreads toward the West Coast.

Overall, foreign firms are becoming more aware of and responsive to the diverse U.S. industrial landscape. The remoteness of interior regions no longer puts states at a disadvantage in attracting foreign investment. The Southwest (dominated by Texas, with great amounts of petrochemical and energy-related investment), Rocky Mountains, Plains, and Far West regions enjoyed greater than average manufacturing growth between 1974 and 1983. Interior states with historically low levels of manufacturing activity--North Dakota, Montana, Wyoming, and others--attracted a surprisingly large amount of direct investment.

In all, U.S. affiliates added 700,000 factory jobs between 1974 and 1983. It is remarkable that job growth occurred during an unusually "bloody" period in the history of U.S. industrial development, when domestic producers shut down

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[18]Because the location quotient indices for Oklahoma, Colorado, Pennsylvania, and Florida are not far from one, they do not seem to be especially favored by foreign firms.

plants or operated at lower rates of capacity utilization, slashing manufacturing jobs by 2.4 million. Over 93 percent of this domestic loss was confined to the Great Lakes and Mideast regions. Some, but not much, employment was restored as the Manufacturing Belt dug its way out of the recession of the early 1980s. Even the falling value of the dollar failed to stimulate manufacturing exports in 1985 and 1986. As old-line domestic industry was caught up in the throes of crisis and spatial restructuring, foreign investment has rushed in. This influx of capital has caught the attention of regional policymakers. However, Manufacturing Belt states need to redouble their efforts to attract this new-found source of industrial growth to compete with the attraction of the South and West to foreign investors.

4. NEW PLANTS, HIGH TECHNOLOGY, AND COUNTY PATTERNS OF FDIUS

4.1 Additional Data Sources and Research Issues

A further exploration of direct investment is necessary to appreciate fully its place in U.S. industrial geography and its role in urban and regional policy. To provide a more comprehensive regional profile, this section draws on alternative data sources compiled by the International Trade Administration (ITA) and the Japan Economic Institute (JEI).[19] The ITA data were assembled from newspaper and journal announcements of foreign firm transactions and from the files of federal regulatory agencies from 1979-1983. Additional data were collected in a 1980 survey of Japanese-owned manufacturing firms and in a 1985 update conducted by the JEI in 1985.[20] Covering 557 plant transactions, these figures were, like the ITA data, compiled mainly by monitoring announcements of transactions in the business press. The main drawback of the JEI and ITA data is that they are limited to plant locations, rather than employment, capital stock, or other (better) measures of foreign activity. However, with these data, aspects of foreign firm activity can be explored that are ruled out by the BEA's statutory disclosure provisions. Most important, these reports make it possible to analyze the regional distribution of new plant sitings. The BEA reports severely restricted our spatial analysis of inward investment by combining all

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[19]In the text, charts, and tables, the ITA and JEI data are cited without any date. The ITA information was supplied on computer tape and the JEI data were found in two reports published by the agency.

[20]The JEI data are supposed to account for all Japanese plants in the U.S., but reflect at best an approximation of the BEA's universe estimates. Still, they contain needed detail on individual transactions. The Japan Economic Institute is the only organization that publishes special reports on direct investment for an individual source country. The availability of these reports is fortunate because it allows for a close look at a how a maturing industrial nation adapts to the evolving international division of labor and spreads direct investment through regions and communities of another advanced nation. Japanese investment in the U.S. grew from $1.18 billion in 1976 to $14.82 billion eight years later (37.2 per cent per year). Manufacturing investment, the subject of the JEI reports, grew by 29 percent per year over the same period, according to BEA figures. Japan increased its share of all FDIUS from 3.8 to 9.3 percent between 1976 and 1974; while Japan's share of manufacturing FDIUS grew from 2.4 to 4.5 percent.

investment types--new plants, acquisitions, equity investment, and so forth--into single state summaries of employment and PPE. For this reason, the substantial job gains from FDIUS described earlier were exaggerated to the extent that the data included acquisitions and equity investment--a transfer of control--and not just new employment and capital formation. The inability to disaggregate the BEA data into the different modes of entry used by U.S. affiliates compelled us to turn to the ITA and JEI's less reliable but more detailed data bases. The ITA included a breakdown of manufacturing investment between *acquisitions and mergers* and *new* (greenfield or start-up) plants for 1979-1983. Likewise, reports by the JEI tracked inward investment by mode of entry for most Japanese plants operating in the U.S.

Dissecting FDIUS by mode of entry, or investment type, helps to determine which regions are actually gaining jobs and capital from inward investment. Indeed, different investment types may exhibit dissimilar geographical patterns; for example, foreign firms may build new plants in less-developed regions but acquire existing assets in more-developed regions, where most domestic capital is located. State and local governments, of course, target their recruitment efforts on new plants, not acquisitions. New start-ups bolster the employment opportunities, increase the capital stock, and enhance the tax base of regions, states, and communities. On the other hand, policymakers tend to be wary of foreign acquisitions. One reason is that acquisitions typically entail a greater degree of external control over local resources. Another is that there often are no compensating gains in jobs or other economic benefits.

Policymakers are also eager to attract high-technology investment to diversify and upgrade the existing industrial base. Where does FDIUS fit into this strategy? Below, we compare the distribution of foreign and domestic technology-intensive industries, as we have done previously for manufacturing as a whole. The data come from a special BEA report. This analysis is enriched through special tabulations by investment type performed on the ITA and JEI data bases.

Finally, we will examine locational patterns at the county level. In Europe and in the less-developed world, the uneven local distribution of multinational investment is a common theme in debates over balanced urban development. However, very little is known about local patterns of foreign firms operating in the U.S. The two attempts to analyze FDIUS empirically below the state level of aggregation reach conflicting conclusions. Papa (1980) looked at the distribution of 444 announced plants during 1978. Among local areas defined by the Bureau of Economic Analysis, he found that plants are not likely to locate in low-income, underdeveloped areas: low-income areas were 21 percent of the total but only had 9 percent of total investment. Another study of 57 new investments for 1974 and 1979 found that most firms (60 percent) located in distressed cities; distress was measured by low income, high unemployment, and low population growth (U.S. Department of Housing and Urban Development, 1979). A more thorough investigation of local patterns of FDIUS was only possible in this study after a painstaking effort was made to identify the county site of each plant given in the ITA and JEI data bases. We are now able to determine whether there is a tendency by foreign multinationals to centralize manufacturing production in more-developed metropolitan areas at the expense of less-urbanized and distressed (low-income) counties of the U.S.

4.2 The Southern Scenario Revisited

Turning to ITA's plant data, we checked to see if our general findings about the regional distribution of FDIUS are upheld by this alternative data source; both the time period and the unit of analysis differ from the BEA's employment and capital stock series discussed in section 3. As a prelude to our analysis of new plant investment, we briefly examine the regional distribution of all plants--factory construction, expansions, acquisitions, and mergers--tracked by the ITA between 1979 and 1983.

The sum of plants in a region was divided by the region's total manufacturing employment in order to discern where foreign plant sites tended to concentrate. Figure 8 is a map of plants per 10,000 manufacturing employees by quartile. In the upper quartile of plants per 10,000 manufacturing employees, the Southeast and Southwest overshadowed the Manufacturing Belt regions, which were in the lowest two quartiles. The Far West and New England fall in the second and the Rocky Mountains in the third highest quartile. These data seem to show a somewhat more southern orientation than the BEA data.[21]

With the ITA data, we find a greater-than-average number of foreign plants (relative to the employment base) in every state of the Southeast and Southwest, except for Arkansas, Oklahoma, and Arizona. At the same time, North Carolina, South Carolina, Tennessee, Virginia, and Texas stand out when we examine this index in conjunction with the states' percentage of all U.S. plants. California and Washington were just above average in plants per employee; a lower-than-average number of plants located in all the Plains and Rocky Mountains states and in every state of the Manufacturing Belt, except Delaware, Maryland, New Jersey, Connecticut, and Rhode Island.

A brief description of Japanese plants by region is in order before we turn to discuss spatial patterns of new plants. When the gross figures for all Japanese plants are normalized by each region's manufacturing employment, we find a far greater concentration in the West Coast than in any other region. The West Coast was followed by the Southwest and Southeast, respectively. Besides California and Washington, a few southern states were especially attractive to Japanese companies. Here attractiveness is measured both in terms of the number of plants per 10,000 employees and the percentage of all plants in each state. The principal beneficiaries were Georgia, Tennessee, Arizona, and Texas. Of all the Manufacturing Belt states, only New Jersey hosted any substantial number of Japanese plant sites.

Thus the pull of the South emerges once again from two additional sources of information. The number of factories acquired or built by foreign firms heavily favored the Southeast, the region that we know is the strongest

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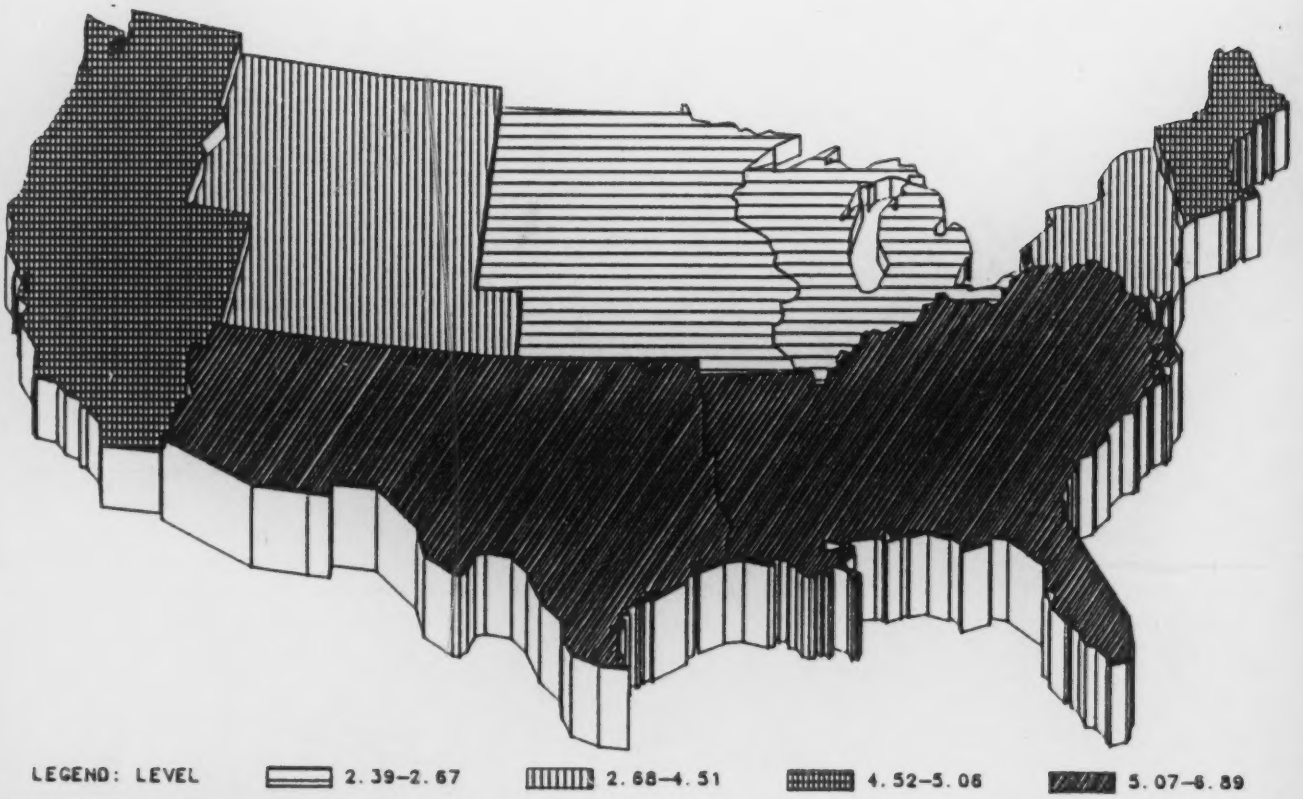
[21]However, the regional breakdown does generally conform with our breakdown of BEA's PPE data on foreign affiliates. Recall that the Southeast and Southwest led the nation in per capita capital stock.

Figure 8

The Location of Foreign-Owned
Plants, 1979-1983



NOTE: LEVEL = PLANTS PER 10,000
MANUFACTURING EMPLOYEES (BY QUARTILE)
DATA: INTERNATIONAL TRADE ADMINISTRATION

base of U.S. affiliate activity.[22] Unfortunately, the ITA or JEI data do not tell us if the average southern plant size tends to be small or large in comparison with size in other regions. Smaller plant size would obviously influence the effect of foreign plant location on regional development. The only way to measure average plant size across regions is to go back to the BEA's 1980 benchmark series on the numbers of manufacturing affiliates employment and PPE. When we did this, we found that the Southeast was eight percentage points below the U.S. average in employment per affiliate but 35 percentage points above average in PPE per affiliate. By contrast, the Great Lakes and Mideast were above average in employment per affiliate but below average in PPE per affiliate. On balance, we can conclude that the greater number of plants clustered in the Southeast is not merely a function of numerous, relatively small-scale operations.

4.3 New Plants Versus Acquisitions

In this section we will see which regions are benefiting the most from foreign manufacturing start-ups in the U.S. Most analysts believe that manufacturing still forms an essential part of the local, state, and regional industrial policy. But attracting new factories has become more and more of a game to out-hustle the competition. Greater tax breaks, subsidies, and other incentives are offered for fewer manufacturing start-ups. A declining number of U.S. manufacturing births makes state and local efforts to attract greenfield investment from abroad more urgent. Buoyed by the growth of manufacturing FDIUS, state and local officials have ventured abroad to sell their regions' unique attributes, only to find that the competition has intensified there as well. Who are the apparent winners in this recruitment battle?

Consider table 7, a cross-tabulation of plants by region and investment type, calculated from the ITA data. For each region, three figures are summarized by the cross-tab: the number of plants, the percentage of a region's plants in each of the two investment types (the row percent), and the region's percentage of total plants within each investment type (the column percent). Even a cursory inspection of the table could not miss the southeastern bias in the location of greenfield investment.[23] Not only is the region far ahead in terms of its absolute number of new plants (39.5 percent of the new plant column total), but foreign start-ups represent a greater percentage of total plants than in any other region (compare the row percents). New England, with a much lower share of the total of new plants (9.3 percent), also exhibits a high percentage of new plants relative to acquisitions and mergers.[24] Evidently, foreign start-ups were an active part of New England's reindustrialization during the

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[22]Note that we are analyzing a stock variable, rather than a growth rate or percentage change.

[23]Note that investment across all regions is predominately composed of new plants, which is true only when we look at numbers of plants rather than values. That is, foreign investors tend to start small plants and buy existing large ones.

[24]This phenomenon is related to the large number of new plants that located in Connecticut during the period.

Table 7

Cross-tabulation for New Foreign-Owned Plants and Acquisitions/Mergers, 1979 through 1983

REGION	INVESTMENT TYPE Acquisitions/ Mergers	New Plants	Total	
New England	14	40	54	NUMBER OF PLANTS
	5.62	9.30	0.08	COLUMN PERCENT
	25.93	74.07		ROW PERCENT
Mideast	65	60	125	
	26.10	13.95	0.18	
	52.00	48.00		
Great Lakes	52	45	97	
	20.88	10.47	0.14	
	53.61	46.39		
Plains	8	16	24	
	3.21	3.72	0.04	
	33.33	66.67		
Southeast	47	170	217	
	18.88	39.53	0.32	
	21.66	78.34		
Southwest	26	45	71	
	10.44	10.47	0.10	
	36.62	63.38		
Rocky Mountains	2	4	6	
	0.80	0.93	0.01	
	33.33	66.67		
Far West	35	50	85	
	14.06	11.63	0.13	
	41.18	58.82		
Total	249	430	679	
	36.67	63.33	100.00	

Data Source: International Trade Administration (ITA)

early 1980s. Table 7 also shows that the Mideast and Great Lakes were the primary beneficiaries of acquisitions and mergers (26.1 and 20.8 percent of the column total, respectively) and were the only regions to actually receive more plants via this mode of entry (investment type) than new plants. There is a statistically significant difference between the mode of entry into the Great Lakes and Mideast on the one hand and all other regions on the other. The chi-square statistic for this 2-by-2 cross-tabulation is 36.5 (significant at the one percent level). The high percentage of acquisitions and mergers in the Manufacturing Belt, then, cannot be explained by random chance.

The cross-tabulation in table 8 demonstrates how the picture changes when we focus on a particular source country, in this case Japan. Since Japanese multinationals have only recently begun to penetrate the U.S., their behavior exposes the effects of alien status and inexperience with U.S. site selection. The Far West received the greatest share of total Japanese affiliate employment since it was closest to the home country. The Far West also had the greatest share of manufacturing plants (34 percent) and the region gained more new plants than any other region (37 percent of the column total in table 8). However we now see that the Southeast, the most distant region from the headquarters of Japanese multinationals, has a slight edge over the Far West in greenfield sites relative to acquisitions and mergers (compare row percents). New plants are far less significant in the Mideast, Great Lakes, Southwest, and New England where acquisitions and mergers are greater.

The contribution of foreign start-ups to regional development was inspected further by breaking out different industrial clusters. Over three-quarters of all new plants in the ITA data base and almost two-thirds of those identified by the JEI were concentrated in 7 of the 22 two-digit Standard Industrial Classification (SIC) industry groups: food and kindred products, chemicals and pharmaceuticals, primary metals, fabricated metals, electrical machinery, nonelectrical machinery, and transportation equipment. Tables 9 and 10 give the regional distribution of these sectors. To assess regional development trends, these figures can be compared with the 1980 distribution of all existing plants, presented in table 11. The Southeast, with 20.7 percent of all chemical plants in the continental U.S., received a much greater share of new chemical plants by foreign firms (42.3 percent), according to table 9. In fact, across the board, the Southeast's share of new foreign-owned plants was larger than its existing share of plants. Observe, for example, that the region held only 13.2 percent of all electrical machinery plants, but 43.3 percent of the foreign start-ups between 1979 and 1983. Percentages of new Japanese factories in the chemical, primary metals, and electrical machinery sectors (table 10) were also extremely high in relation to the existing number of plants. In contrast, the Great Lakes region fared poorly. Its share of start-ups was below its existing share of plants in all sectors except transport equipment and Japanese-owned nonelectrical machinery plants. Another strong industry cluster was chemicals in the Southwest, which had 23.9 percent of new foreign plant investment (table 9) compared with its 9.6 percent share of all chemical factories in the U.S. The Mideast did well in attracting new primary and fabricated metal facilities from abroad; New England benefited primarily from nonelectrical machinery start-ups. The Far West received a relatively high percentage of the food sector and the region had a greater percentage of Japanese start-ups than it had existing facilities in every sector but transport equipment.

Table 8

Cross-tabulation for Japanese New Plants and Acquisitions/Mergers

REGION	Acquisitions/ Mergers	New Plants	Total	
	INVESTMENT TYPE			
New England	13	9	22	NUMBER OF PLANTS
	4.96	3.05	0.04	COLUMN PERCENT
	59.09	40.91		ROW PERCENT
Mideast	40	34	74	
	15.27	11.53	0.13	
	54.05	45.95		
Great Lakes	40	39	79	
	15.27	13.22	0.14	
	50.63	49.37		
Plains	11	13	24	
	4.20	4.41	0.04	
	45.83	54.17		
Southeast	47	68	115	
	17.94	23.05	0.21	
	40.87	59.13		
Southwest	29	21	50	
	11.07	7.12	0.09	
	58.00	42.00		
Rocky Mountains	3	2	5	
	1.15	0.68	0.01	
	60.00	40.00		
Far West	79	109	188	
	30.15	36.95	0.34	
	42.02	57.98		
Total	262	295	557	
	47.04	52.96	100.00	

Data Source: Japan Economic Institute (JEI)

Table 9

Distribution of ITA Data in 2-Digit Manufacturing Industries
New Plants

Region	Food and Kindred Products		Chemicals and Pharmaceuticals		Primary Metals		Fabricated Metals		Non-Electrical Machinery		Electrical Machinery		Transport Equipment	
	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry
New England	2	7.41	2	2.82	2	7.41	3	15.79	16	17.20	6	8.96	.	.
Mideast	4	14.81	7	9.86	7	25.93	4	21.05	13	13.98	6	8.96	5	21.74
Great Lakes	1	3.70	8	11.27	2	7.41	1	5.26	13	13.98	5	7.46	6	26.09
Plains	2	7.41	2	2.82	1	3.70	3	15.79	2	2.15	3	4.48	.	.
Southeast	9	33.33	30	42.25	9	33.33	5	26.32	35	37.63	29	43.28	11	47.83
Southwest	1	3.70	17	23.94	3	11.11	1	5.26	6	6.45	6	8.96	1	4.35
Rocky Mountains	1	3.70	1	1.41	.	.	.	.	.	.	1	1.49	.	.
Far West	7	25.93	4	5.63	3	11.11	2	10.53	8	8.60	11	16.42	.	.
U.S.	27	100.00	71	100.00	27	100.00	19	100.00	93	100.00	67	100.00	23	100.00

Data Source: International Trade Administration

Table 10

Distribution of JEI Data in 2-Digit Manufacturing Industries
New Plants

Region	Food and Kindred Products		Chemicals and Pharmaceuticals		Primary Metals		Fabricated Metals		Non-Electrical Machinery		Electrical Machinery		Transport Equipment	
	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry
New England	.	.	.	.	.	.	1	3.33	3	9.09	1	1.49	.	.
Mideast	1	4.00	3	18.75	4	22.22	2	6.67	4	12.12	4	5.97	2	7.41
Great Lakes	3	12.00	.	.	1	5.56	4	13.33	8	24.24	7	10.45	10	37.04
Plains	.	.	3	18.75	1	5.56	1	3.33	1	3.03	2	2.99	4	14.81
Southeast	2	8.00	5	31.25	5	27.78	5	16.67	4	12.12	23	34.33	6	22.22
Southwest	.	.	3	18.77	2	11.11	6	20.00	1	3.03	7	10.45	1	3.70
Rocky Mountains	.	.	.	.	1	5.56	1	3.33	.	.	.	.	.	.
Far West	19	76.00	2	12.50	4	22.22	10	33.33	12	36.36	23	34.33	4	14.81
U.S.	25	100.00	16	100.00	18	100.00	30	100.00	33	100.00	67	100.00	27	100.00

Data Source: Japan Economic Institute

Table 11

Distribution of 2-Digit Manufacturing Industries

Region	Food and Kindred Products		Chemicals and Pharmaceuticals		Primary Metals		Fabricated Metals		Non-Electrical Machinery		Electrical Machinery		Transport Equipment	
	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry	No. of Plants	% of Industry
New England	1107	5.17	638	5.32	597	8.45	2753	8.09	4020	7.90	1514	9.42	562	6.19
Mideast	3681	17.19	2562	21.36	1286	18.21	5991	17.61	7577	14.89	3260	20.29	981	10.81
Great Lakes	3896	18.20	2277	18.98	2160	30.59	8900	26.16	13972	27.46	2788	17.36	1816	20.01
Plains	2370	11.07	888	7.40	414	5.86	2087	6.13	3687	7.25	833	5.19	603	6.64
Southeast	4361	20.37	2484	20.71	963	13.64	4874	14.33	6898	13.56	2129	13.25	1978	21.79
Southwest	1718	8.02	1149	9.58	523	7.41	3138	9.22	4816	9.47	1227	7.64	833	9.18
Rocky Mountains	808	3.77	254	2.12	124	1.76	744	2.19	1090	2.14	340	2.12	170	1.87
Far West	3468	16.20	1745	14.55	995	14.09	5531	16.26	8813	17.32	3973	24.73	2133	23.50
U.S.	21409	100.00	11997	100.00	7062	100.00	34018	100.00	50873	100.00	16064	100.00	9076	100.00

Data Source: County Business Patterns

4.4 High-Technology Location

Regional policymakers, who prize new investment in any industry, have been ardent in pursuing technology-intensive investment during the past decade. Much attention has been given to the regional competition for this industrial segment, which constitutes about one-quarter of total manufacturing employment. High-technology investment is deemed desirable because it is the most dynamic component of manufacturing and presumably augments the technical and scientific substratum of employment. It thus helps to build a foundation for future innovation-led growth--the kind of growth that is critical to long-run regional development, according to the product or profit cycle theories (Markusen, 1985). Whether or not high technology actually fructifies the innovative capacity of regional economies, however, is an open question: branch plants of technology-intensive firms often involve little more than routine assembly and low-skill, low-paying jobs.

Measures used to define U.S. high-technology industries are commonly based on the proportion of technical occupations in the industry labor force, research and development expenditures as a percent of industry output, rapid employment growth, or a combination of these factors--not necessarily innovative activity as such. For instance, the U.S. Congress Office of Technology Assessment (1984) created a list of high-tech industries based on whether an industry had a ratio of R&D to sales one-third greater than the average for manufacturing and whether it experienced a 10-year increase in employment above the manufacturing average. High-technology industries are commonly believed to be experimental or innovative industries. Yet the industrial organization of many high-tech industries is in fact dominated by mature oligopolies which have relatively high R&D outlays and auspicious long-run growth prospects.

Hence foreign manufacturing firms may play an important role in the interregional rivalry over high technology. There is ample evidence that foreign investment tends to be concentrated in the technology-intensive industries of the source nation yet an overseas high-technology industry is not necessarily "high-tech" domestically. In many cases, the investments may be in the assembly end of a high-tech industry and will require low-wage, low-skilled labor. Indeed many foreign oligopolies have obtained competitive advantages over mature U.S. firms by investing more in research and development. Japanese steel and automobile industries are a case in point. Analyzing the technology intensity of foreign firms relative to other firms in the home economy, however, is beyond the scope of this study.

Instead we can examine the extent to which affiliates are competing in domestic high-technology sectors and whether they exhibit similar spatial patterns. Employing a broad composite measure to define high technology (using the U.S. Congress Office of Technology Assessment (1984) definitions), the BEA ran some special tabulations on its U.S. affiliate employment files. BEA aggregated affiliate employment to the state level, then compared it with domestic

high technology employment for 1977 and 1983.[25] Several aspects of the BEA data on high-technology are worth highlighting.

Foreign Versus Domestic Growth: Domestic high-technology manufacturing jobs in the U.S. were about the same in 1983 as in 1977, although they rose to 6.7 million in 1979 and then declined to 6 million in 1983 as the worst of the postwar recessions hit the American economy. Meanwhile, even the downturn in the business cycle did not deter high-technology affiliate employment growth, which doubled to about 800,000 jobs between 1977 to 1983.

Concentration and Spread of High-Technology: High-tech U.S. affiliates contributed more to U.S. high-technology manufacturing employment than affiliates in all industries contributed to overall U.S. manufacturing. In 1983, affiliate shares of high-technology employment were especially large in the Southeast (20.7 percent of the region's high-tech jobs), the Rocky Mountains (18.5), the Mideast (17.7), and the Southwest (16.0). Shares were considerably less in the Great Lakes (9.8), Plains (9.0), Far West (8.6), and New England (8.3). Foreign firms have made significant inroads into the high-technology employment base of many states. In every state, 1983 high-tech affiliates were a greater percentage of high-technology employment than manufacturing affiliates were a percentage of total manufacturing employment. In many states the foreign high-tech share was over 20 percent, well beyond the 6 to 8 percent shares that characterized manufacturing affiliate employment.

Foreign high-technology employment is spread among states that are "demographically, industrially, and geographically diverse" (Coleman, 1985; p. 15). The states with above-average concentrations of high technology employment as a percent of their total U.S. affiliate employment are Texas, New Jersey, North Carolina, Wisconsin, South Carolina, Florida, Louisiana, West Virginia, Georgia, Oklahoma, Utah, Alabama, Iowa, and Arkansas.

Location quotients, derived by taking a state's share of foreign high-tech employment relative to domestic high-tech employment, point to an interesting phenomenon: key high-technology centers such as Connecticut, Massachusetts, Arizona, and California have relatively low location quotients, while the Southeastern states again stand out, having higher shares of U.S. affiliates relative to domestic shares of high technology. Other states with a lot of high-technology employment are New Jersey, Rhode Island, and Wisconsin in the Manufacturing Belt, Maine on the Canadian border, New Mexico and Texas in the Southwest, and Utah in the Rocky Mountains. The 1983 location quotients for high technology are more scattered than they are for manufacturing industries as a whole (Woodward, 1986; Appendix D and Appendix H).

Let us now take a closer look at high-technology FDIUS by again breaking out the ITA and JEI data on new plants by industry. The ITA and JEI data

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[25]These estimates are found in Coleman (1985). Oddly, some states in Coleman's report show greater high-technology manufacturing employment than total manufacturing employment. Notwithstanding certain anomalies in the tables, this unpublished report is the BEA's only source of total high-tech U.S. affiliate employment.

were tabulated by the four-digit high-technology definitions, developed by Glasmeier and her colleagues, to see where new foreign plants tended to locate relative to other industry types. Here "high-tech foreign firms" were considered to be those that are competing in technically advanced industries, defined according to the proportion of technical occupations in the domestic industry labor force (Glasmeier et al., 1985). With these definitions, foreign high technology was broken out according to investment type.

Tables 12 and 13 show fewer high-tech foreign plants than other industry types in regions, except in the Great Lakes and Southwest, where there were more start-ups in high-tech industries. These tables also reveal that the high-tech portion of new plants exceeded the high-tech portion of acquisitions (46 percent versus 32 percent). This was the case in all regions, as shown in the row percentages of tables 12 and 13. The same is true for Japanese investment in the U.S., as shown tables 14 and 15. Japanese high-technology factories account for 46.0 percent of all new plants; only 33.2 percent of all acquisitions are in the high-technology sector.[26]

To conclude, high-technology U.S. affiliates are widely scattered, do not closely resemble the location patterns of the domestic high-technology industry, and are more oriented toward investment in new plants (as opposed to acquisitions) than are other types of U.S. affiliates. While technology transfer from the U.S. back to the source country is conceivable, so is a transfer flowing in the opposite direction. The high proportion of new high-tech plants relative to acquisitions indicates that multinational corporations (MNCs) are drawing on ownership advantages to directly compete with domestic high-technology firms in the national and regional markets of the U.S. It is likely that foreign-owned firms add to the technological base of regions as much as they imitate and exploit existing technologies.

5. COUNTY PATTERNS OF INWARD INVESTMENT

5.1 Urban Attraction

The dispersion of U.S. affiliates during the late 1970s and early 1980s, including the diffusion of high technology, suggests that the influx of foreign MNCs may help reduce spatial disparities and support more balanced regional development. While manufacturing investment may benefit the Southeast and the growing regions of the West more than the Manufacturing Belt, it is not overconcentrated in any particular area. These findings at first seem to contradict Holland (1976) and others who argue that MNCs (at least U.S. MNCs abroad) cluster in more developed regions and thereby exacerbate regional imbalance and uneven development. Such clustering is one of the most criticized features of MNC activity in other countries. One plausible reason for the absence of regional enclaves of direct investment in the U.S. is that American markets and resources are distributed across the whole continent.

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[26]Minor exceptions to this phenomenon at the regional level are found in the Mideast and Rocky Mountains.

Table 12

Cross-tabulation for Foreign-Owned High Technology
Versus Other New Plants, 1979-1983

REGION	INDUSTRY TYPE: High-tech	Other	Total	
New England	15	25	40	NUMBER OF PLANTS
	3.49	5.81	9.30	PERCENT OF TOTAL
	37.50	62.50		ROW PERCENT
Mideast	20	40	60	
	4.65	9.30	13.95	
	33.33	66.67		
Great Lakes	23	22	45	
	5.35	5.12	10.47	
	51.11	48.89		
Plains	7	9		
	1.63	2.09	3.72	
	43.75	56.25		
Southeast	77	93	170	
	17.91	21.63	39.53	
	45.29	54.71		
Southwest	29	16	45	
	6.74	3.72	10.47	
	64.44	35.56		
Rocky Mountains	2	2	4	
	0.47	0.47	0.93	
	50.00	50.00		
Far West	23	27	50	
	5.35	6.28	11.63	
	46.00	54.00		
Total	196	234		
	45.58	54.42	100.00	

Data Source: International Trade Administration (ITA)

Table 13

Cross-tabulation for Foreign-Owned High Technology
Versus Other Acquisitions/Mergers, 1979-1983

REGION	INVESTMENT TYPE: High-tech	Other	Total	
New England	5	9	14	NUMBER OF PLANTS
	2.01	3.61	5.62	PERCENT OF TOTAL
	35.71	64.29		ROW PERCENT
Mideast	18	47	65	
	7.23	18.88	26.10	
	27.69	72.31		
Great Lakes	17	35	52	
	6.83	14.06	20.88	
	32.69	67.31		
Plains	1	7	8	
	0.40	2.81	3.21	
	12.50	87.50		
Southeast	12	35	47	
	4.82	14.06	18.88	
	25.53	74.47		
Southwest	11	15	26	
	4.42	6.02	10.44	
	42.31	57.69		
Rocky Mountains	2	0	2	
	0.80	0.00	0.80	
	100.00	0.00		
Far West	13	22	35	
	5.22	8.84	14.06	
	37.14	62.86		
Total	79	170	249	
	31.73	68.27	100.00	

Data Source: International Trade Administration (ITA)

Table 14

Cross-tabulation for Japanese High Technology and Other New Plant Locations

REGION	INVESTMENT TYPE: High-tech	Other	Total	
New England	6	3	9	NUMBER OF PLANTS
	2.03	1.02	3.05	PERCENT OF TOTAL
	66.67	33.33		ROW PERCENT
Mideast	16	18	34	
	5.42	6.10	11.53	
	47.06	52.94		
Great Lakes	13	26	39	
	4.41	8.81	13.22	
	33.33	66.67		
Plains	7	6	13	
	2.37	2.03	4.41	
	53.85	46.15		
Southeast	28	40	68	
	9.49	13.56	23.05	
	41.18	58.82		
Southwest	10	11	21	
	3.39	3.73	7.12	
	47.62	52.38		
Rocky Mountains	0	2	2	
	0.00	0.68	0.68	
	0.00	100.00		
Far West	41	68	109	
	13.90	23.05	36.95	
	37.61	62.39		
Total	121	174	295	
	41.02	58.98	100.00	

Data Source: Japan Economic Institute (JEI)

Table 15

Cross-tabulation for Japanese High Technology and Other Acquisitions/Mergers

REGION	INVESTMENT TYPE: High-Tech	Other	Total	
New England	4	9	13	NUMBER OF PLANTS
	1.53	3.44	4.96	PERCENT OF TOTAL
	30.77	69.23		ROW PERCENT
Mideast	20	20	40	
	7.63	7.63	15.27	
	50.00	50.00		
Great Lakes	13	27	40	
	4.96	10.31	15.27	
	32.50	67.50		
	14.94	15.43		
Plains	2	9	11	
	0.76	3.44	4.20	
	18.18	81.82		
Southeast	12	35	47	
	4.58	13.36	17.94	
	25.53	74.47		
Southwest	4	25	29	
	1.53	9.54	11.07	
	13.79	86.21		
	4.60	14.29		
Rocky Mountains	1	2	3	
	0.38	0.76	1.15	
	33.33	66.67		
	1.15	1.14		
Far West	31	48	79	
	11.83	18.32	30.15	
	39.24	60.76		
	35.63	27.43		
Total	87	175	262	
	33.21	66.79	100.00	

Data Source: Japan Economic Institute (JEI)

However, before any firm conclusions are drawn about the MNCs' contribution to balanced spatial development, we must explore locational patterns at a more disaggregated geographical level. Given the locational requirements of mature foreign firms, an urban orientation is expected; one does not expect a decentralized pattern, which would benefit peripheral manufacturing areas. This is because MNCs are believed to desire metropolitan characteristics--market access, transport facilities, communication links--above labor cost, the only real advantage that nonmetropolitan, peripheral locations have to offer. In addition, a lack of experience with U.S. production and the distance between the U.S. site and the home office adds uncertainty to the site selection decision. This in turn raises the pull of urban agglomeration above the well-known centripetal effects of localization economies.

To quantify the metropolitan dimensions of FDIUS, U.S. Bureau of the Census (1982) data on the degree of urbanization in U.S. counties were merged with the ITA and JEI plant location data. Of 3,109 counties in the continental U.S., 10 percent of the total are highly urbanized, with greater than 80 percent of their populations residing in urbanized areas; 34 percent have a moderate degree of urbanization with between 40 and 80 percent of the population in urbanized areas; and 56 percent are rural, with less than 40 percent in urbanized areas.

Figure 9 depicts an unmistakable urban bias in the selection of new county sites chosen between 1979 and 1983. On the right side of the figure we see that about 56 percent of all new plants were placed in the 10 percent highly urbanized counties. Only 12.5 percent of the plants were constructed in the 56 percent of all counties defined as rural, shown on the left side of figure 9.[27]

This skewed urban pattern is mirrored by the distribution of Japanese plants. The two bars on the right side of figure 10 illustrate that about 62 percent of all new Japanese plants located in highly urbanized counties (constituting one-tenth of all counties), whereas only 10.5 percent went to rural counties. Japanese plants are unevenly distributed at the local level: plants locating in Los Angeles County vastly outnumber any other county in the U.S., and in general Japanese factories are clustered in fewer counties compared with the ITA distribution of plants from all source countries.[28] Cultural ties and proximity to West Coast urban centers evidently exert a strong pull.

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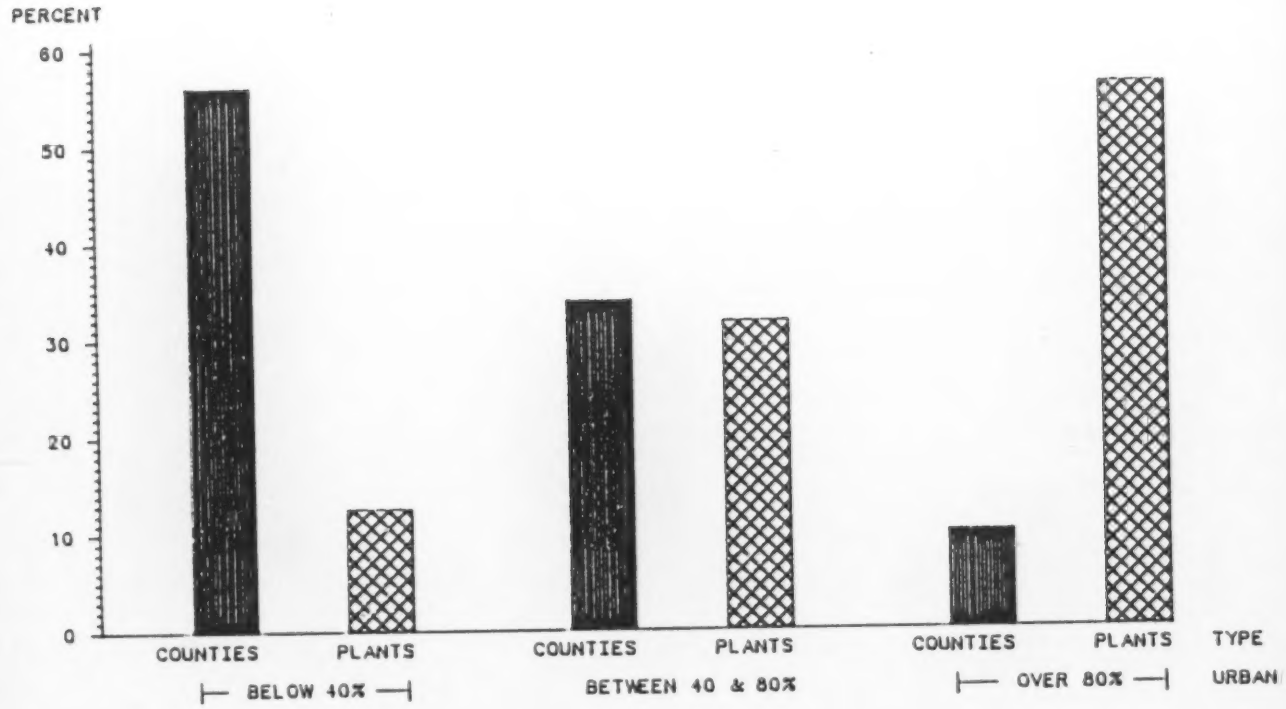
[27]The 430 new plants identified by the ITA were fairly evenly spread out among the urbanized counties. Counties receiving just one new plant represented 70 percent of all counties with investment; the largest number of plants in any county was 14 (in two cases).

[28]Of the 555 reported locations for all Japanese manufacturing plants (including acquisitions), 63 (11 percent) were in Los Angeles. Another 20 percent was found in the eight other counties: Orange, California; Cook (Chicago), Illinois; Santa Clara (the "Silicon Valley"), California; Dallas, Texas; Harris (Houston), Texas; Bergen (bordering New York City), New Jersey; San Diego, California, and Alameda (Oakland), California.

Figure 9

Percentage of New Foreign-Owned Plants
by Urban Level, 1979-1983

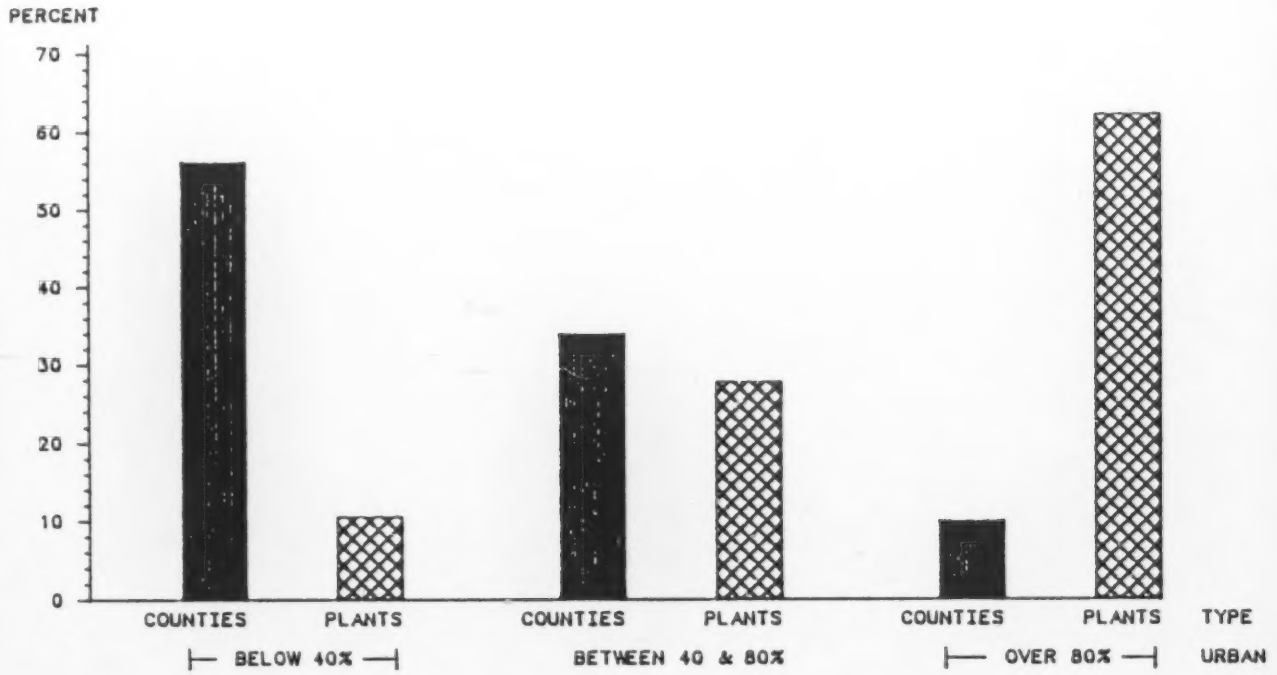


POPULATION RESIDING IN URBAN AREAS (1980)

DATA SOURCES: U.S. CENSUS (1982);
INTERNATIONAL TRADE ADMINISTRATION

Figure 10

Percentage of New Japanese Plants
by Urban Level



POPULATION RESIDING IN URBAN AREAS (1980)

DATA SOURCES: U.S. CENSUS (1982);
JAPAN ECONOMIC INSTITUTE

But Japanese corporations are gaining a reputation for their penetration of urban and suburban areas of the Southeast as well.[29] It is likely that they will continue to filter through the urban system as they further penetrate eastern markets of the U.S. The East can be served from a locational base within the Atlantic urban corridor and smaller communities below the Mason-Dixon line. The smaller communities offer nonunionized work forces and connections to major markets through the interstate highway system.

5.2 Plant Location and the Nonmetropolitan South

It has been argued that, besides the Manufacturing Belt, the nonmetropolitan South is perhaps the area most vulnerable to job displacement effects from increased international competition from low-cost imports and overseas investment to newly industrialized nations. It now appears that FDIUS may help make up for job losses in the South. A partial explanation for the South's attractiveness to foreign investors--the "southern strategy" of FDIUS--might be that foreign investors are driven to locate in areas most competitive with offshore locations for low-cost, assembly-type manufacturing. As protectionist sentiment in the U.S. rises, direct investment that otherwise might not flow into the country for fundamental economic reasons may shift toward less developed southern locations.

Cross-tabs were calculated to break out plant location differences in the South and non-South in terms of urbanization (low, middle, and high).[30] It was found that southern locations tended to be somewhat less urbanized than other regions when the frequency tabulations were run on both the ITA and JEI data. Coincidentally, the ITA's 430 new plant investments evenly divided into 215 sites in the South and 215 elsewhere. Southern counties with low urbanization levels received 35 plants (16 percent), while counties outside the South received 19 plants (9 percent); counties in the middle urbanization group received 76 plants (35 percent) and 60 plants (28 percent) for the South and non-South, respectively. This leaves 48 percent in the highly urbanized South and 63 percent in the outside the South. Similarly, of the 292 new Japanese plants, 16 of 87 (18 percent) were found in rural (low urbanized) southern counties, compared with 15 of 205 (7 percent) in rural counties outside the South. The South had 44 percent of its Japanese plants in the most urbanized counties, while other regions had 69 percent. A metropolitan-nonmetropolitan "southern strategy" was also

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[29]For example, after General Motors announced the location of its innovative Saturn plant in Tennessee in 1985, the largest single domestic investment in U.S. history, the governor of Tennessee took out a full page advertisement in the *Wall Street Journal* to boast of his state's virtues as a manufacturing site. Yet his statement also praised G.M.'s Japanese rivals, who located in the outskirts of Nashville five years before. It appears that G.M. will not only model its restructuring effort on Japanese labor practices and production techniques, but that it has actually followed an apparent Japanese preference for suburban Southeastern manufacturing sites.

[30]Urbanization level was based on the percentage of the population classified as urban by the U.S. Bureau of the Census. The South is comprised of the Southeast and Southwest Census regions.

detected in patterns of Japanese electronic investment. The industry is known to be particularly sensitive to trade barriers. The Far West and Southeast both gained 23 new electronics factories according to the JEI's records. In the Far West, almost all the investment--20 plants, or 87 percent--located within the most urbanized county level. In the Southeast, only 8 plants (35 percent) were found in the most urbanized counties, while 8 plants were found in rural areas.

The nature of investment in the less urbanized areas of the South was further explored by cross-tabulating plant locations against the metropolitan/nonmetropolitan county definitions developed by the Southern Growth Policies Board (Rosenfeld et al., 1985). According to this classification scheme, metropolitan areas encompass counties with an urban area of at least 50,000 inhabitants and surrounding counties where a majority of inhabitants depend on the city for services and employment. Nonmetropolitan areas include five types of counties:

> **adjacent/corridor**--adjacent to a metropolitan county, with at least three interstate interchanges or one interchange within twenty miles of the center of the county;
>
> **adjacent**--adjacent to a metropolitan county, but no interstate interchanges within twenty miles of the center;
>
> **corridor**--nonadjacent, with at least three interstate interchanges or one within ten miles of the center of the county.
>
> **tier**--nonadjacent, containing an interstate highway, but with fewer than three interchanges and none within ten miles of the center;
>
> **remote**--nonadjacent, and with no direct access to an interstate highway interchanges.

Notwithstanding the tendency to build factories in less urbanized southern counties vis-a-vis less urbanized counties elsewhere, tables 16 and 17 reveal that foreign investors still overwhelmingly prefer southern metropolitan areas. We see that metropolitan areas account for three-quarters of the new plant investment identified by both the ITA and JEI.[31] Within nonmetropolitan areas, foreign investors by and large opted for adjacent/corridor counties rather than adjacent counties without links to the interstate highway system. These findings suggest that transportation access may be an important locational advantage desired by foreign investors locating in southern nonmetropolitan areas. The econometric analysis reported in section 6 will show the extent to which transportation access influenced county site selection for new foreign-owned plants in the U.S., after controlling for urbanization.

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[31]The Southern Growth Policy Board's definition of the South includes all states in the Southeast and Southwest according to the BEA regional classification, except New Mexico and Arizona.

Table 16

New Plant Sites in the Metropolitan/Nonmetropolitan South

COUNTY TYPE	NUMBER OF PLANTS	CUMULATIVE FREQUENCY	PERCENT	CUMULATIVE PERCENT
Metro	156	156	75.000	75.000
Adjacent/Corridor	26	182	12.500	87.500
Corridor	10	192	4.808	92.308
Adjacent	3	195	1.442	93.750
Tier	4	199	1.923	95.673
Remote	9	208	4.327	100.000

Data Sources: International Trade Administration; Rosenfeld et al. (1985)

Table 17

New Japanese Plant Sites in the Metropolitan/Nonmetropolitan South

COUNTY TYPE	NUMBER OF PLANTS	CUMULATIVE FREQUENCY	PERCENT	CUMULATIVE PERCENT
Metro	64	64	74.419	74.419
Adjacent/Corridor	13	77	15.116	89.535
Corridor	2	79	2.326	91.860
Adjacent	4	83	4.651	96.512
Tier	1	84	1.163	97.674
Remote	2	86	2.326	100.000

Data Sources: Japan Economic Institute; Rosenfeld et al. (1985)

5.3 Plant Location and County Per-capita Income

Rural counties need investment as agricultural employment is displaced by mechanization and the consolidation of farm land holdings by agribusiness. But the location of new foreign factories in the U.S. evidently does not benefit rural counties. Distressed counties with low per-capita incomes are also generally avoided by foreign plants. High per capita income regions tend to benefit. This phenomenon is summarized in table 18, a cross-tabulation of county income level and the 430 announced new plant sites from 1979-1983 identified by the ITA. Three levels of per capita income were defined according to Census county population characteristics:[32] about 46 percent of all counties are classified as low income, almost 50 percent as middle income, and about 7 percent as high income. Around 32 percent of all plants located in the select group of high-income counties, about 57 percent in the middle, and 11 percent in the low-income group (see the total column of table 18). When Japanese plants were tabulated with these income classifications, an even greater number were found to locate in the high-income counties (50.0 percent); fewer located in low-income (5.5 percent).

Regional differences in the county-level distribution of plants by income level may give us further insight into the spatial strategies of foreign firms operating in the U.S. Table 18 presents frequency tabulations for plant location in low-, middle-, and high-income counties for the South (the Southeast and Southwest) versus the rest of the nation. Again, this breakdown of the ITA data is illustrative because it evenly divides the 430 new plants into two distinct regional categories. Low-income counties of the South received 37 start-ups of the 215 total observations (17 percent); just 11 of 215 new sites (5 percent) were in the low-income counties of other regions. We also find that nonsouthern regions collectively have a much greater share of investment in high-income counties. A total of 95 plants, or 44 percent of the investment outside the South, went into high-income counties (7 percent of all counties in the U.S.), whereas only 41 plants, (19 percent) located in the high-income areas of the South. The chi-square statistic for this cross-tabulation is 38.71, significant at the 1 percent level.

Granted, the South has more low-income counties than other regions. But there is no reason to expect that the high-income areas of South should not attract investment in the same proportion as high-income areas in other regions--unless there is something special pulling foreigners toward low-income counties. That "something special" might be much lower wages, an abundant supply of unskilled and semiskilled labor, and an almost universal and deeply ingrained antipathy toward unions. It seems that when foreign firms value these characteristics above all else, low-income areas of the South are principal beneficiaries of new plant location.[33] It should be noted that the industrial

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[32]Derived from the Census' Summary File Tape 3C (U.S. Bureau of the Census, 1982), the county per capita income levels are less than 80 percent of the U.S. county average, between 80 and 110 percent, and over 110 percent. The distribution is such that many counties lie just below the mean.

[33]The same pattern emerged when this cross-tab was run on the Japanese plant location data.

Table 18

Crosstabulation of County Income Level and
the Location of New Plants, 1979-1983

INCOME LEVEL	REGION TYPE: South	Other	Total	
Low	37	11	48	NUMBER OF PLANTS
	8.60	2.56	11.16	PERCENT OF TOTAL
	77.08	22.92		ROW PERCENT
	17.21	5.12		COLUMN PERCENT
Middle	137	109	246	
	31.86	25.35	57.21	
	55.69	44.31		
	63.72	50.70		
High	41	95	136	
	9.53	22.09	31.63	
	30.15	69.85		
	19.07	44.19		
Total	215	215	430	
	50.00	50.00	100.00	

Chi-square=38.71 DF=2 Confidence Level=0.99

Note: Low: Per capita income less than 80 percent of U.S. average
Middle: Per capita income between 80 and 110 percent
High: Per capita income more than 110 percent

Data Sources: International Trade Administration, U.S. Census (1982)

composition of the 37 new plant investments in the rural South is dominated by the non-high-technology sector--81 percent, compared with the U.S. average of 54 percent (see table 10).[34]

5.6 Summary

Our examination of foreign-owned factories has given us a clearer picture of FDIUS and U.S. regional development. First, we were able to separate new plants from acquisitions/mergers. From the figures presented above, we know that new plant expansions contributed more to the economic base of the Southeast, Southwest, Far West, and New England than to the Great Lakes and Mideast, which received relatively more investment through acquisitions of existing capital. Greenfield investment is preferred since it clearly represents a net gain in regional employment and output. However, foreign acquisitions, along with joint ventures with U.S. firms, may also boost regional economic growth if capacity is underutilized or in the process of abandonment by domestic firms with below-normal or declining profits.[35]

We also found that U.S. affiliates account for a relatively large portion of regional high-tech employment, especially in the Southeast. Much of the investment in high technology takes the form of new plants. It is also apparent that foreign competition in technology-intensive industries is not confined to regions or states known to be among the more technologically advanced, such as Massachusetts or California. In this respect, high-technology affiliates are akin to technical branch plants of domestic firms: they are distributed widely across all regions of the U.S. The data suggest, however, that there are substantial differences in domestic and foreign preferences for high-tech location.

Despite the regional dispersion of FDIUS, most investment remains clustered in high-income urban areas. The degree of metropolitan centralization is less pronounced in the South, but even there the attraction to urban areas is strong. Apart from urbanization, access to the interstate highway system may be a possible locational determinant of local site selection. In the next section, we will deepen our empirical investigation of FDIUS and the dynamics of contemporary industrial location through econometric analyses of regional (state) and local (county) determinants of foreign investment.

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[34]Even high-technology industries (accounting for seven plants, or 19 percent of foreign-owned factories in the South) may only locate labor-intensive, assembly operations in low-income, rural areas. It is impossible to say whether this is the case here, since we really do not know which processes, within the electronics sector for instance, are placed in the South.

[35]Examples of this revitalization of existing plant and equipment are found coast to coast. In South Carolina, the German multinational Bode and Company purchased a site of an abandoned textile mill in 1981, turning it into a metal-fabricating plant that produces aluminum bus and subway doors. In California, General Motors, in a joint venture with Toyota Motor Corporation, allowed Japanese managers to take charge of a troubled plant in Fremont in 1982. With Japanese-style production methods, the plant turned into a model for profitable automobile assembly in the U.S.

6. STATE AND COUNTY LOCATION DETERMINANTS: REGRESSION ANALYSIS

6.1 Previous Results

Identifying the determinants of regional and local economic growth is a principal objective of industrial location research, but progress toward this goal has been delayed by a separation of empirical and theoretical work (Wheat, 1973; Czamanski, 1981). On one side is the pure theory of spatial equilibrium, the "central place" models that originated in the work of Losch (1954). Abstract modeling of general equilibrium on a hypothetical, homogeneous plain is admired for its formal properties, not its empirical validity or policy relevance, and has led to what Holland (1976) called the "apotheosis of method." In a quest for formal elegance, location theorists seem preoccupied with defining the "ideal" regional system and oblivious to the findings of empirical analysts. Arguing that more attention should be given to the empirical side of industrial location research, Wheat (1973; p. xi) wrote:

> A basic problem is that the literature has a strong theoretical bias. Most students of regional growth and industrial location are primarily concerned with theory and model-building. Assumptions and hypotheses tend to take the place of facts ... The relative overemphasis on theory is so severe, in fact, that model-builders often ignore what little empirical knowledge there is--such as findings suggesting that climate may play a very important role in industrial location.

Despite a spate of studies by Wheat (1973; 1986), Czamanski (1981), Schmenner (1983), Carlton (1979; 1983), Plaut and Pluta (1983), Bartik (1985), and others, our empirical knowledge of the determinants of urban and regional growth is still rather limited.

Less still is known about the subnational determinants of U.S. affiliate location. Before discussing the hypotheses and methodology underlying the statistical analysis performed in this study, we will review what previous work has uncovered. Besides the descriptive studies reviewed above, the literature on FDIUS and regional location includes survey research and regression analyses.

Investor surveys have pointed to a number of salient regional characteristics responsible for geographical patterns of FDIUS. An early study by Mandell and Killian (1974) found that foreign investors ranked locational factors in the following order: nearness to markets, availability of labor, transportation facilities, and government aid. A more comprehensive study of foreign manufacturers conducted by Arpan and Ricks (1975) pointed to similar locational factors. They found that the major influence on the decision to locate in a state was market proximity, followed in importance by transportation facilities, labor factors, and taxes. In a still larger sample of foreign manufacturing firms, respondents rated thirty-two different plant location factors (Tong, 1979). The five most important were availability of transportation services, labor attitudes, ample space for future expansion, nearness to markets within the U.S., and availability of suitable plant sites. Generally, the survey evidence indicates that

markets, transportation facilities, and labor factors are more important to foreign firms than taxes or incentives (Arpan, 1981).

These findings are broadly consistent with recent surveys of domestic multiplant location decisions (Schmenner, 1983). However, the problem is that investor surveys depend on the nature of the survey design, the sampling procedure, and ultimately the subjective response of sampled firms, rather than on the actual outcomes of the firm's site selection decision. It is difficult to compare and contrast the survey results. We are left wondering which factors might account for the observed differences in domestic and foreign spatial patterns detected in our descriptive analysis.

Analysts have turned to regression analysis to gain further insight into locational determinants. The first attempt was Little (1978), who regressed various state characteristics against a U.S. affiliate location quotient--the ratio of foreign and domestic plant investment shares for 1975 and 1976. She found that foreign investors were more sensitive than domestic producers to wage differentials, while domestic producers were more sensitive to energy costs and the availability of large ports. Insignificant variables were personal income, the degree of unionization, state industrial incentives, trade missions or development offices overseas, state and local tax revenues per capita, manufacturing employees, annual average output per work-hour, and the unemployment rate. The author presented no strong rationale for these results. The reader is left wondering why, for example, wages are more important to foreign investors and ports more important to domestic investors.[36]

In another attempt to explain the subnational distribution of FDIUS, McConnell (1980) used stepwise regression to test a large number of locational factors against a state's percentage share of total foreign-owned plants in 1976. He found that a state's share increased in response to the following: the number of establishments with more than twenty employees per capita, the urban population as a percentage of total state population, location in the Manufacturing Belt, state and local expenditures per capita, and the state's population per square mile. A state's share decreased with a state's "social well-being" index, the distance from New York City to the state's largest metropolitan area, total retail sales, and federal aid per capita to state and local governments. Union membership was among the variables reported to be not significant.

McConnell's results, like Little's, are interesting, but again the analysis was performed on the number of foreign investments, rather than employment or value. Also, it covered only one year, 1976. That year ended just as FDIUS was about to accelerate. Further, the dependent variable--shares of total plant investment in the U.S--will clearly vary with state population and employment

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[36]Little's regression contained two major limitations. First, she looked only at plant investment and covered only a limited time period. Second, by using a location quotient measure as the dependent variable, Little was unable to draw any conclusions about the relative importance of locational factors. For example, an independent variable that positively and significantly affected both domestic and foreign location--for example, markets or unionization--may not show up as significant when a location quotient is used as the dependent variable.

size. Since the dependent variable was not normalized, the attraction to the Manufacturing Belt, stressed in the paper, is not as evident as the author claimed. Another difficulty with McConnell's analysis was that it failed to set out any central hypotheses. His stepwise regression algorithm mixed several explicit and implicit market variables: retail sales per-capita was negatively related to the dependent variable, for instance. The explanatory factor yielding the greatest contribution to the explained variation in the dependent variable was a state's percentage of population residing in metropolitan areas, which again may be a proxy for markets. If anything, urbanization is a more important determinant of location *within* a state. We are again left without any clear knowledge about the major influences on the regional distribution of foreign investment.

By and large, these previous efforts have not met with resounding success.[37] Econometric modeling of FDIUS has been impeded by data deficiencies. The few regression analyses of regional location attempted so far also suffer from an absence of any strong prior hypotheses about which factors determine the spatial distribution of foreign production in the U.S. Notably absent are any explicit hypotheses about the importance of markets and labor.

Indeed some locational factors may have become more important to firms during the recent historical period of globalization. Structural change in the 1970s--above all greater global competition and decline in profitability of manufacturing industries--has altered the character and speed of spatial adjustment (Markusen, 1985). This regional restructuring process is particularly relevant to oligopolistic firms, which tend to overconcentrate in regions and then rapidly disperse when profit margins from oligopolistic rents are no longer secure.

Earlier, we showed that both foreign and domestic firms were dispersing from two different regional bases, that is, from the East Coast and from the inland Manufacturing Belt. The observed concentration of foreign manufacturing in the Southeast in 1974 suggested a particularly strong labor-climate orientation. Below, our econometric results for the determinants of the initial (1974) concentrations of FDIUS will demonstrate whether the hypothesis holds up to empirical scrutiny. Regression analysis was also performed on the subsequent regional patterns of domestic and foreign employment dispersion. A major effort was made to identify the factors that determined regional changes in manufacturing during the 1970s and early 1980s, a period of substantial regional restructuring. An extensive discussion of the dispersion hypotheses follows in the next section. Finally, locational factors were tested against the county distribution of new plants. Previous work has sometimes mixed regional and local site selection, using local factors such as transport facilities and suitable plant sites in regional regressions. In order to isolate independent local influences, we must first neutralize regional influences. The methodological procedure and statistical results for the county-level regression are discussed later, following regional analysis presented in the next two sections.

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[37]Two unpublished studies of the regional determinants of FDIUS (Luger and Shetty, 1985; Kahley, 1986) are reviewed in Woodward (1986).

6.2 Determinants of Regional Concentration and Dispersion

6.2.1 Regional Location Hypotheses

The theory of regional restructuring suggests that a few regional characteristics--markets, labor, and technology--are likely to influence the spatial distribution of foreign and domestic employment.[38] Several variables that fall into these broad categories were tested in the different regression analyses of regional location reported below. Additional explanatory variables were carefully chosen after a thorough review of the empirical literature on industrial location. The next step is to show how these hypotheses were "operationalized," that is, posited in an empirically verifiable form.

Markets: Before the acceleration of FDIUS in the mid-1970s, foreign investment tended to locate along the East Coast and Canadian border. It is possible that this base served regional markets much as the Manufacturing Belt has historically served as the base for domestic firms. To test the effect of geographical proximity to the major source countries of FDIUS, *BORDERCOAST*, an East Coast-Canadian border dummy variable was created. It has a value of one for all states located on the East Coast of the Manufacturing Belt and for three Canadian border states usually considered outside the Manufacturing Belt (Maine, New Hampshire, and Vermont); *BORDERCOAST* is zero elsewhere.

As we noted earlier, foreign capital appeared more responsive to the diversity of U.S. regions over the past fifteen years. Woodward (1986; chapter 3) presented a case for competitive market pull on the recent dispersion of FDIUS, but the effect of regional markets on foreign location is not clear in the empirical literature reviewed above. Nor is it clear from studies of domestic industrial location. Both Fuch's (1962) pioneering work and more recent analyses like Plaut and Pluta (1983) downplayed the pull of markets on regional location. Wheat (1986) challenged the findings of both studies arguing that the authors included "nonmarket" variables, which effectively acted as proxies for markets (for instance, land availability as measured by population per square mile). The same criticism applies to previous regression analyses of foreign investment. Wheat's point was that we must be careful not to specify a model of regional change that includes several variables duplicating the pull of markets; instead we must choose the best among all alternative variables that represent market potential. In some studies of domestic location, market pull is measured by a region's distance from the Manufacturing Belt (from Pittsburgh, for example), since a greater transportation cost saving is obtained for new branch plants if they are farther away from agglomeration in the core region (Norton, 1986; Wheat, 1986). For foreign entrants, however, this variable is inappropriate; *a priori* there is no reason to expect that foreign firms are in the process of relocating from the Manufacturing Belt. The principal market variable tested in this study is based on the supply/demand ratio hypothesis periodically put forth in the regional growth literature (Perloff et al., 1960; Wheat, 1973; Norton, 1986). Regions where traditional manufacturing activity is low in relation to demand offer greater opportunities for extending market share (a goal of mature oligopolies) than regions already saturated with existing manufacturing supply. With

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[38]For a review of the literature on regional restructure, see Norton (1986).

heightened international competition and the introduction of better communications technology, foreign manufacturers may have sought more advantageous sites than those on the East Coast by opening branch plants closer to strong sources of demand, where there is relatively less competition from existing producers. The supply/demand form of the market hypothesis has not been tested previously against spatial patterns of U.S. affiliates.

In most empirical research, state personal income represents regional demand, while manufacturing employment represents supply, or the existing concentration of manufacturing. The ratio of the two variables captures the extent to which regions contain underdeveloped and exploitable manufacturing potential. Essentially, this ratio gives us a way of operationalizing the supply/demand hypothesis. We follow Plaut and Pluta (1983), who adjusted a state's personal income and manufacturing employment according to its geographical position in relation to all other states:

$$(4)\quad PIP_i = \sum_{j=1}^{48} PI_j/d_{ij}^2$$

$$(5)\quad EMPP_i = \sum_{j=1}^{48} EMP_j/d_{ij}^2$$

where PI_j and EMP_j are, respectively, personal income and manufacturing employment in state j and d_{ij} is a state's population centroid, that is, the distance from center of population in state i to state j. The distance from a state to itself (d_{ii}) is measured by one-half the average radius of the state. The market variable tested in regressions (*MARKET*) is the ratio of the two "gravity" measures, personal income potential (*PIP*), and manufacturing employment potential (*EMPP*).

MARKET should show up as a positive and statistically significant influence on the dispersion of both foreign and domestic activity. Another measure of demand is *MARKETGR*, the seven-year percent change in per capita income prior to 1974.[39] *MARKETGR* represents a sort of acceleration hypothesis of investment, in which states with large demand growth induce an immediate supply response; this contrasts with the long-run, or structural supply/demand type adjustment implied by *MARKET*. The hypothesis is admittedly shaky, at least when tested on foreign firms. A supply response to increased demand is most likely to occur in industries oriented to the local market, such as ice, bakery products, bricks, and newspapers; supply and demand must remain in balance in those industries. Local-market industries are unlikely to attract much foreign investment. But if local markets do attract FDIUS, our expectation is that *MARKETGR* will be positively associated with regional manufacturing growth.

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[39]Since the correlation between *MARKET* and *MARKETGR* is only 0.39, multicollinearity between the variables is not likely.

Filtering Down and Thresholds: Wheat's (1973; 1986) studies of domestic industrial location showed that several western states experienced slower manufacturing growth than one would expect, given their relatively strong market potential. His regressions overpredicted manufacturing employment change for these states. On the basis of these results, Wheat (1986; p. 7) inductively formed the following hypothesis:

> The apparent reason for this phenomenon was that these states had failed to cross a developmental threshold that leads to faster growth. Too much underdevelopment can inhibit growth by (1) making the regional market too small for economies of scale, (2) putting the underdeveloped state too far from the regional market center of gravity, (3) depriving the state of strong intermediate markets, or SMSAs where industries cluster to buy and sell from each other, (4) depriving the state of external economies, such as skilled labor, that are associated with large SMSAs, and (5) depriving the state of residential, cultural, and other amenities found in large SMSAs.

Wheat's threshold hypothesis states that "too much" underdevelopment and remoteness weakens the regional growth stimulus from strong markets. In his regression on 1963-1977 manufacturing employment change, Wheat found that the predicted values for employment growth in Montana and Wyoming, two states with the smallest major cities, left seriously large (negative) residual growth. Therefore he used a two-state dummy variable (1 = Montana or Wyoming; 0 = all other states) to capture what he called the "threshold effect." This variable (*THRESHOLD*) was included in our regressions on foreign and domestic regional growth. *THRESHOLD* represents outliers, or extreme cases of underdevelopment acting as an inhibitor to growth. Our study extends beyond Wheat, however, by more generally testing the reluctance to invest in geographically isolated, industrially underdeveloped states. We include a rural/underdevelopment variable, *RURAL*, the ratio of farm population to manufacturing employment in a state. According to Wheat, *THRESHOLD* is an absolute concept based on total SMSA population. We felt that it would be interesting to test Wheat's basic idea, not only as an absolute concept but also as a relative concept, as embodied in *RURAL*. This variable ranks interior states--in the Rocky Mountains and Plains regions--in the upper quartile; the Great Lakes and the coastal states are found in the bottom quartile.

Wheat also noted that the filtering down of product cycle theory suggests that manufacturing is decentralizing from metropolitan to nonmetropolitan areas. But the ratio of rural to urban population, included in his empirical tests, was left out of regressions in this study because it was believed that the spatial filtering process favoring rural growth is better tested with local (county) data on manufacturing location.

To test the product or profit-cycle filtering across regions, a different approach was taken. In Woodward (1986), it was noted that firms locate regional branch plants away from the seedbeds of technological innovation as their profit (or product) cycles mature. This hypothesis is buttressed by the oligopolistic

systems literature.[40] With the recent development of "permissive technology" (telecommunications and jumbo jet transport, for example), oligopolies are increasingly footloose and are no longer tethered to core areas as previously. As the pull of research and development weakens, manufacturing jobs leave and we witness an extension of the spatial division of labor. This implies reduced job growth in areas with corporate headquarters and research, all other things remaining the same. Moreover, the greatest employment growth in the product cycle theory occurs after the period of innovation, when dispersion and relocation dynamics begin to surface with the routinization of production processes. Changes in manufacturing activity, then, may be negatively associated with research and development as assembly processes are diffused through space.[41]

The technology-filtering hypothesis is even more difficult to operationalize than market potential or labor climate. Some studies have used a state's percentage of the population with a high school degree in regressions, although analysts are not always clear about what sort of effect it should have. While high school and college achievement were found to be negatively correlated with regional change, a better measure of technological filtering is a state's research and development personnel as a percentage of nonagricultural employment. This variable is designated as *R&D*.

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[40]For a review of this literature, see Storper (1985).

[41]This hypothesis might explain the results of Plaut and Pluta (1983), Kahley (1986), and others who find that industry appears "repelled" by skilled labor.

It will be interesting to see whether domestic and foreign firms differ in their response to *R&D*. Unlike the peripheral filtering of domestic branch plants, the movement of foreign branch plants into less technically advanced regions may be offset by an aggressive, technology-oriented strategy that induces foreign firms to locate near innovative domestic industries. Extending the argument originally put forth by Sametz (1974) and Sametz and Backman (1974), we assert that foreign oligopolies may seek to enhance their competitive position and hold on to technological leads by locating near the wellsprings of U.S. technology. Although the expected sign on *R&D* is uncertain, the variable was included in the regressions to see what sort of influence the variable had when other locational factors were controlled.[42]

Labor: Much of the discussion about the movement of jobs to the Sunbelt has centered around the congenial business climate of southern and western states. A rather nebulous phrase, "business climate" usually denotes some combination of low unionization, right-to-work laws, low taxes, and governmental support for private capital accumulation. In this study, we tested a measure of "labor climate" rather than of business climate. The basis for including labor climate was the state's degree of labor militance. Woodward (1986) has argued that the strength of the Southeast was part of a conscious strategy to take advantage of the region's unorganized and malleable workforce. Foreign firms often require different job categories from those commonly employed in American industry and introduce foreign-style managerial practices. A labor climate variable should account for the rigidities, particularly union-negotiated work rules and work stoppages, that would have impeded the introduction of foreign production practices.

Regional labor climate is difficult to measure, but several indicators are available, including unionization rates and the presence of state right-to-work laws. To avoid multicollinearity, only one variable at a time, unionization or a right-to-work dummy variable, was entered as the best proxy for labor climate in the various regression tests reported below. Unionization is denoted as UNION;

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[42]In addition to the regressions on the determinants of manufacturing activity, it would have been interesting to test the regional change in foreign and domestic high technology. Unfortunately, the BEA series on U.S. affiliate high-technology employment (Coleman, 1985) contain numerous states for which the data are unreliable. Dropping these observations leads to a serious loss in the degrees of freedom and consequently the results of the regressions were rather poor. Of all the variables discussed in this chapter, only the *MARKET* was significant, while the overall model was statistically insignificant according to its F-value. This problem was not encountered in the model for domestic high-tech growth. A regression run on the BEA series on high-technology employment for 1977 to 1983, the years provided in the Coleman report, yielded results quite close to those for total domestic manufacturing presented later in this chapter.

the right-to-work dummy by RIGHT-TO-WORK.[43] Several other labor variables were added to the regression equations on foreign and domestic regional growth. The average price of labor was an obvious choice. Labor cost, measured by wages, is the primary labor variable in many location models. Low wages have been a key reason that labor-intensive manufacturing relocated in the South. *WAGE*, the average hourly earnings of manufacturing workers, may still influence domestic regional dispersion in the U.S., but have little or no effect on U.S. affiliates,[44] since foreign firms are not believed to be labor-cost oriented.

UNEMPRATE, the average unemployment rate in the early 1970s, was added to the regressions to pick up the influence of labor availability, as it has in other regression analyses. The measure also serves as a leading indicator of wage hikes and the changing labor climate among states: it has a dampening influence on labor militancy and wages. Of course, employers would like to hire and fire workers at will; *UNION* in part controls for this. Finally, *UNEMPBEN*, the average unemployment benefit paid per covered worker in a state, was included to see if employers were adversely influenced by the costs of layoffs. Together, *UNION*, *WAGE*, *UNEMPRATE*, and *UNEMPBEN* reflect the complex regional differences in labor--its frictions (or rigidities), costs, and availability.

Climate: This factor has shown up as a consistent and surprisingly strong influence on state industrial growth in numerous empirical studies (Fuchs, 1962; Wheat, 1973; 1986; Plaut and Pluta, 1983). Cold winters raise plant construction and operating costs, cause transportation delays and worker absenteeism, and serve as a negative "quality of life" factor, making it difficult to attract managers and workers in mobile occupations (Wheat, 1986). Foreign firms, then, could be affected by differences in climate, just like domestic firms. *CLIMATE* was measured by a state's average number of heating degree days.

Taxes and State Spending: In theory, high taxes deter industrial growth. Yet taxes typically do not show up as a significant influence in empirical studies of business location (Plaut and Pluta, 1983). There is even less reason to believe they play a decisive role in the location of foreign firms. Multinationals can use transfer pricing to shift tax burdens among different national subsidiaries. In fact, the antithesis of the taxes-deter-growth theory may be the rule: high taxes help support the infrastructure and human capital needs of private capital, leading us to believe *a priori* that the relation between taxes and location is at best ambiguous.

Nevertheless, given the controversy surrounding taxes, separate tax and spending variables were tested. First, *CORPTAX*, the percentage of state and

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[43]But we should note that observed *changes* in foreign locational patterns may not respond to labor climate variables because foreign firms are not in the process of dispersing from the Manufacturing Belt to the Sunbelt. This was the case with Kahley's (1986) regression on foreign multiestablishment employment change. Instead, *UNION* may show up as a significant factor behind the *initial* distribution of foreign activity and the *change* in domestic location during the 1970s.

[44]*WAGE* shows a moderately high, but far from perfect, correlation (0.65) with *UNION*.

local taxes coming from corporate income taxes, was tested. Corporate income taxes are a small portion of most state tax collections. But the tax varies greatly among states, accounting for a relatively high percent of tax collections in Pennsylvania, Kentucky, Tennessee, and Massachusetts; it is not imposed at all in Nevada, Texas, Washington, and Wyoming. It was believed that business location decisions might be particularly sensitive to the variable. Of course, corporations can and do find ways of avoiding or passing on the tax. The reason for including the variable is that it provides a signal of business political clout in a state. Like *UNION*, *CORPTAX* measures pro- versus anti-business attitudes among states.

The opposing side of the tax question is the degree to which states raise revenue to support the needs of capital accumulation and commerce. In making location decisions, business often looks for a well-developed public infrastructure and quality education. Surveys have found that foreign and domestic investors are influenced by the strength of a state's public spending. *STSPENDING*, state spending per-capita, serves as an indicator of state commitments to social overhead capital.

State unitary taxes are the third variable in the tax-versus-spending cluster. MNCs are known to intensely dislike unitary tax laws. In the 1980s, at least 20 nations filed official protests in the U.S. on behalf of multinational corporations, complaining that unitary taxes subjected foreign firms to double taxation, required burdensome accounting procedures, and forced MNCs to write detailed reports on their global operations (Lindsey, 1985). State comptrollers, on the other hand, often champion the tax because it counters transfer pricing. By reporting paper losses in a state while channeling real profits to the books of foreign subsidiaries, MNCs avoid state profit taxes. Yet under the unitary tax formula MNCs are not taxed according to profits made in the state. Instead, the unitary formula determines the corporate tax from the percentage of total (unitary) company sales, payroll, or property in a given state.

A unitary tax law indicates a more hostile environment toward multinational business. The presence of these laws, then, may show up as a negative determinant of foreign firm location, but should not influence domestic location. *UNITARY* was entered as a dummy variable (1 = states with the law; 0 = states without unitary tax laws) in the regressions on foreign employment growth.

6.2.2 Methodology

Table 19 summarizes the hypothesized signs of the 14 variables tested in the alternative regression analyses of domestic and foreign manufacturing employment reported below. Our next consideration is the methodology that underlies the analysis. The BEA's state manufacturing employment series is the best source for testing the spatial behavior of foreign manufacturing firms. State employment data published by the Bureau of Labor Statistics were used to test the regional patterns of domestic firms (domestic employment was determined by subtracting U.S. affiliate employment from total manufacturing employment). State data are justified here, as in other studies, since a foreign firm's regional selection primarily consists of choices among states (McConnell, 1983). This is also consistent with most empirical research on domestic location.

Table 19

Independent Variables Tested Against
Foreign and Domestic Growth

Variable Name	Variable Description	Expected Sign
Markets:		
MARKET	Gravity-adjusted ratio of personal income to manufacturing employment	+
MARKETGR	Percentage change in per capita income (1967-1974)	+
Labor:		
UNION	Principal components index of unionization rates, right-to-work laws and strike activity.	-
RIGHT-TO-WORK	Dummy variable. States with right-to-work laws = 1, all other states = 0.	+
WAGE	Average hourly earning of manufacturing employees.	-
UNEMPRATE	Unemployment rate (proxy for labor rate).	+
UNEMPBEN	Average unemployment benefit.	-
Filtering Down and Thresholds:		
THRESHOLD	Dummy variable for Montana and Wyoming.	-
RURAL	Ratio of farm population to manufacturing employment.	-
R&D	R&D related employment per total nonagricultural employment.	?
Climate:		
CLIMATE	Average number of heating days per year.	-
Taxes and Spending:		
CORPTAX	Percentage of state taxes derived from corporate income taxes.	-
STSPENDING	State spending per capita.	+
UNITARY	Dummy variable for states with unitary tax laws.	-

Regressions were run on the initial concentration of per capita employment in 1974 and then on employment growth in the 1970s and early 1980s. To measure regional growth, it is common to use the percent change in manufacturing employment over a five- or ten-year period, since relatively long periods capture important trends in industrial activity and bridge the problems posed by short-term economic cycles. An extended period is necessary in this study because large, lumpy investments distort the yearly change in foreign employment. The longest running series on FDIUS is the BEA's series on U.S. affiliate employment, available for 1974 through 1983 at the time this study was conducted.[45]

A more fundamental methodological problem arises from the BEA's inclusion of acquisitions and equity investment, which distort actual state employment growth from direct investment. In previous tests on FDIUS, where the data combined acquisitions and equity investment along with new additions to employment, researchers often failed to admit the nature of the problem. This is perhaps because there is little that anyone can do about it, except to drop those outlier states with large acquisitions. In our analysis, Delaware was deleted from our analysis because its employment growth was found to be "contaminated" by one large equity investment during the period, the Canadian corporation Seagram's stake in DuPont.

Once we have decided to use employment change as the dependent variable, we must choose an appropriate time period for the independent variables. Cross-sectional studies of state economic growth typically regress the percentage change in manufacturing employment against levels of the independent variables set in the initial period. Industrial growth is then seen as a response to differences in manufacturing profitability among states. The theoretical justification for the formulation is "disequilibrium adjustment" to state differentials in profitability: differentials in profitability at the beginning of the period are believed to spur employment changes. But within the confines of this model, there is no real basis for assuming disequilibrium in state profitability during the initial period. Market demand or unionization, for instance, can hardly be considered shocks that upset long-run equilibrium, forcing movements in productive activity among states. The profit cycle model (Markusen, 1985) provides us with an alternative conceptual base for regional dispersion. Woodward (1986) argued that the rationale for observed adjustments to "disequilibrium" in the 1970s and early 1980s was the mass restructuring brought on by a more competitive international economy and the profit squeeze of mature industry.

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[45]Objections could be raised about using 1983 as the terminal year, since the U.S. economy was still recovering from a deep recession. Some regions have industrial mixes that are prone to lose jobs during economic downturns and regain employment during expansions. Surprisingly, the recession did not affect trends in regional dispersion; in fact, regressions run on the 1974 to 1980 employment change yielded similar results to those run on 1974 to 1983 change, confirming that structural, as opposed to cyclical change was responsible for employment trends.

Ordinary least squares (OLS) was used to obtain the estimates. Since all independent variables were taken at the beginning of the period, we avoided any possible simultaneous equations bias. A 10-percent level of significance was considered reasonable for the employment change regressions because a large number of variables were tested in relation to the number of observations. Standardized estimates, or beta weights, were calculated to show how the dependent variable changed given changes in the explanatory variables, regardless of the units of measurement.

6.2.3 Multiple Regression Results

To begin to draw out the distinctiveness of foreign employment patterns, a state's 1974 domestic per capita manufacturing employment *DOMESTIC* was held constant in the regressions on foreign per capita employment as the dependent variable. Other independent variables, the 14 variables listed in table 19 and *BORDERCOAST*, were then added to the equation to see if they had an influence on the 1974 pattern of U.S. affiliate investment. Estimates for two explanatory variables were significant--*UNION* and *BORDERCOAST*.

Results of the regression when just *UNION*, *BORDERCOAST*, and *DOMESTIC* were entered are shown in table 20. The estimates demonstrate that the coastal-border orientation and anti-union proclivities of foreign firms are statistically significant, in spite of the close relationship between U.S. affiliate and domestic employment patterns in 1974. Note further that the *UNION* variable accounts for some of the variation in U.S. affiliate location, even though the affiliate data include foreign acquisitions of U.S. manufacturing corporations, which are larger in the North and dampen the observed pull toward less unionized, right-to-work states.

Now that we have accounted for factors that explain differences in foreign and domestic location concentration, let us see which determinants were significant in explaining differences during the ensuing period of dispersion between 1974 and 1983. We begin our analysis with a regression that points to the principal determinants of domestic employment change. OLS estimates of 12 of the independent variables presented in table 19 and the regression statistics for both the foreign and domestic employment change equations are displayed in table 21. The regressors explain 78 percent and 87 percent of the variance in state manufacturing employment changes for foreign and domestic firms, respectively. The adjusted R^2s are high for cross-sectional regressions. The F-value shows that we can reject the hypothesis that the explanatory variables are jointly equal to zero at the 1 percent level of significance.

Assessing the relative contribution of the independent variables to observed changes in employment requires a detailed discussion. Despite the lower R^2, the regression for domestic manufacturing is superior to the one for foreign manufacturing. For domestic manufacturing, the signs on the explanatory variables overwhelmingly matched our expectations. Note that despite the large number of variables included in the equation and the interrelationship between some of them, 2 of the 12 variables had both the correct sign and were significant at the 1 percent level (*MARKET* and *THRESHOLD*); 6 variables were significant at the 5 percent level (*UNION*, *WAGE*, *UNEMPRATE*, *UNEMPBEN*,

Table 20

Explanation of Per-Capita Foreign Manufacturing Employment for 1974

Variable	Parameter Estimate	Standardized Estimate
UNION	-0.004**	0.201
	(0.002)	
BORDERCOAST	1.409***	0.355
	(0.430)	
PER CAPITA DOMESTIC EMP	31.603***	0.570
	(6.081)	
INTERCEPT	0.348	----

R^2 = 0.647

Adjusted R^2 = 0.623
F-Value (3,45) = 26.890***

Standard errors are in parentheses
*** Significant at 1 percent level
** Significant at 5 percent level
* Significant at 10 percent level

Table 21

Explanation of Foreign and Domestic Employment Growth Using "Domestic" Model, 1974-1983

Variable	Domestic Employment Growth		Foreign Employment Growth	
	Parameter Estimate	Standardized Estimate	Parameter Estimate	Standardized Estimate
MARKET	13.9192***	0.6836	77.8274*	0.1447
	(2.1263)		(42.9505)	
MARKETGR	0.3135*	0.1809	1.2010	0.0262
	(0.1819)		(3.6743)	
UNION	-0.0006**	-0.2830	0.0054	0.1052
	(0.0003)		(0.0055)	
WAGE	-0.0010**	-0.3080	-0.0018	-0.0330
	(0.0004)		(0.0093)	
UNEMPRATE	0.02700**	0.2534	-0.0069	-0.0025
	(0.0126)		(0.2540)	
UNEMPBEN	-0.0010**	-0.2577	-0.0116	-0.1153
	(0.0004)		(0.0092)	
CORPTAX	-0.0107**	-0.1791	0.0699	0.0444
	(0.0049)		(0.0996)	
STSPENDING	0.0003*	0.2037	-0.0030	-0.0750
	(0.0002)		(0.0034)	
THRESHOLD	-0.2734***	-0.3240	19.5088***	0.8755
	(0.0664)		(1.3396)	
CLIMATE	0.00003***	0.3826	-0.00007	-0.0331
	(0.0000)		(0.0002)	
R&D	-0.0061**	-0.2225	0.0437	0.0606
	(0.0025)		(0.0514)	
RURAL	-0.0119*	-0.1806	0.2171	0.1248
	(0.0069)		(0.1404)	
INTERCEPT	-0.6999		-0.5180	
	(0.1608)		(3.2492)	
R^2 = 0.83982			R^2 = 0.9053	
Adjusted R^2 = 0.7811			Adjusted R^2 = 0.8719	
F-Value (12, 34) = 14.679***			F-Value (12, 34) = 27.095***	

Standard errors are in parentheses
*** Significant at 1 percent level
** Significant at 5 percent level
* Significant at 10 percent level

CORPTAX, and *R&D*); and 3 at the 10 percent level (*MARKETGR*, *STSPENDING*, and *RURAL*). The hypothesis that the estimates were not significantly different from zero could not be rejected for any of the variables, although the sign on *CLIMATE* (heating degree days) is not as expected.

The standardized estimates reported in table 21 give us a sense of the relative importance of the explanatory variables.[46] Standardized coefficients (or beta weights) show the average standard deviation change in the dependent variable, holding the other explanatory variables constant. A standard deviation change in *MARKET* by one unit, for instance, leads to a standard deviation change of 0.68 for domestic employment growth; a one standard deviation change in *WAGE* leads to a standard deviation change of -0.31 for the dependent variable. Each standardized estimate can be interpreted as a measure of the proportion of the total variation in the dependent variable that is explained by that independent variable. *MARKET* clearly stands out in the domestic equation. *MARKET* is followed in order by *THRESHOLD*, *WAGE*, *UNION*, *UNEMPBEN*, and *UNEMPRATE*.

The domestic equation can be used as a benchmark against which we can contrast the behavior of U.S. affiliate employment change. In general, it is more difficult to model the behavior of U.S. affiliate location, notwithstanding the higher R^2. Of the 12 explanatory variables, only *THRESHOLD* is significant at the 1 percent level. Indeed the R^2 is high because Montana and Wyoming, which are accounted for by the *THRESHOLD* dummy variable, had such large *increases* in foreign affiliate jobs. The only other significant variable, *MARKET*, was so at the 10 percent level.

The results presented in table 20 suggest that the state determinants of foreign and domestic employment growth are fundamentally different. The nature of these differences were brought to light when we specified a new equation that was explicitly tailored to changes in foreign employment spatial patterns. First, we dropped all the labor variables from the regression and entered *RIGHT-TO-WORK*.[47] Next, the *R&D* variable, which we have argued has an ambiguous effect on FDIUS, was removed. *CLIMATE* was also dropped because the results given in table 20 showed that its effect is the opposite of what we expect. We can conjecture that this finding, which differs from those of previous empirical studies of domestic employment growth, is tied to the resurgence of New England and to high growth in other relatively cold areas such as Utah, Nevada, and Colorado during the period. Finally, *CORPTAX* was replaced by *UNITARY*, the unitary tax dummy variable, since it is unitary taxation that is disliked most by multinational corporations. We retain the *MARKET*, *MARKETGR*, *STSPENDING*, *THRESHOLD*, and *RURAL* variables.

The results from this new specification for both foreign and domestic growth are given in table 22. Observe that the F-value has risen substantially

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[46]These estimates are provided because the units of measurement for the independent variables vary and are difficult to interpret in some cases.

[47] We could have used *UNION*, but the right-to-work dummy variable yielded a significant and somewhat surprising result, as explained below.

Table 22

Explanation of Foreign and Domestic Employment Growth Using "Foreign" Model, 1974-1983

Variable	Domestic Employment Growth		Foreign Employment Growth	
	Parameter Estimate	Standardized Estimate	Parameter Estimate	Standardized Estimate
MARKET	10.2310***	0.5025	131.655***	0.2448
	(2.9770)		(36.9597)	
MARKETGR	0.5730***	0.3306	5.1530*	0.1126
	(0.2257)		(2.8026)	
RIGHT-TO-WORK	0.0620	0.1799	-1.2498**	-0.1374
	(0.04691)		(0.5825)	
STSPENDING	0.0001	0.0879	-0.0061**	-0.1518
	(0.0002)		(0.0026)	
THRESHOLD	-0.2828***	-0.3351	19.9785***	0.8966
	(0.0935)		(1.1610)	
RURAL	-0.0183	-0.0336	0.2872***	0.1652
	(0.0079)		(0.0977)	
UNITARY	0.0183	0.0440	-1.7383***	-0.1581
	(0.0510)		(0.6330)	
INTERCEPT	-0.9542		-0.5180	
	(0.1395)		(3.2492)	
R^2 = 0.6168			R^2 = 0.9153	
Adjusted R^2 = 0.5481			Adjusted R^2 = 0.9001	
F-Value (6, 40) = 8.970***			F-Value (6, 40) = 60.214***	

Standard errors are in parentheses
*** Significant at 1 percent level
** Significant at 5 percent level
* Significant at 10 percent level

for the foreign equation and fallen for the domestic. Of the seven independent variables, four are significant in the foreign equation (*MARKET, THRESHOLD, RURAL*, and *UNITARY*); two variables (*RIGHT-TO-WORK* and *STSPENDING*) are significant at the 5 percent level, while *MARKETGR* is significant at the 10 percent level. In contrast, only *MARKET, MARKETGR*, and *THRESHOLD* are significant (all the 1 percent level) in the domestic employment growth equation.

A detailed comparison of the domestic and foreign employment equations reveals some interesting similarities and differences.

Markets: profit cycle theorists like Markusen (1985) argue that market share extension is the fundamental objective of mature oligopolies. Of course, demand may be served from any location in the U.S., but foreign firms can increase market share by taking advantage of regional gaps in demand and supply. The sign on *MARKET* in the foreign equations in table 21 and 22 is correct and the standardized estimate is relatively high, just as it is in the domestic equations. These findings, which strongly corroborate the "supply/demand" market hypothesis, imply that foreign manufacturers are competing with domestic manufacturers to supply underdeveloped regional markets.

The sign and significance of the estimate for *MARKETGR* might suggest that per-capita income growth influenced foreign manufacturing growth as it did domestic growth. But a few caveats are in order. Domestic manufacturers probably react more quickly to increasing demand because some firms are oriented to local markets and which respond to *increases* in demand rather than to long-standing imbalances between supply and demand. We recognize the possibility of reverse causality in this case: changes in the dependent variable (employment growth) could cause changes in per-capita income. Although *MARKETGR* is per capita income growth in 1967-1974, it might effectively be serving as a proxy for per capita income growth in the 1974-1983 period.

Labor: In the original specification (table 21) we found several labor variables accounted for the variation in domestic employment growth among states. None of the labor variables were significantly different from zero in the foreign equation. For instance, *UNEMPRATE* and *WAGE* were insignificant in the foreign equation given in table 21, unlike in the domestic equation. *WAGE* was expected to exert some pull on domestic firms as standardized, low-skill production processes are relocated to low-wage regions. This dynamic of the industry life cycle was not considered particularly relevant to foreign oligopoly in the U.S. The insignificance of *UNEMPRATE* indicates that the variable is a rather poor proxy for the labor supply, at least for foreign firms. Later in this report we will see how foreign affiliates respond to labor characteristics at the county level.

In table 22, we see that the foreign employment growth was influenced by a state's labor climate, but not in the manner one might expect. Indeed, U.S. affiliate employment growth was lower in right-to-work states, all other things being equal. If *UNION* is entered in lieu of *RIGHT-TO-WORK*, the sign on the estimate is positive, the opposite of what we expected, but it is insignificant. The reason for the apparently pro-union attraction of foreign firms is related to the nature of the dependent variable--which represents the percentage change, not the stock of employment in a state. Foreign investors were already

concentrated in less unionized states in 1974, while domestic firms have been relatively late in moving from the Manufacturing Belt to the more flexible labor climate of the Sunbelt.[48] Still, the absence of an inverse relationship between a pro-union labor climate and foreign job growth is somewhat peculiar. It suggests that affiliates are no longer as adverse to organized labor in America as they were previously.

Thresholds, rural isolation, and spatial filtering: *THRESHOLD* and *RURAL*, both significantly different from zero in the U.S. affiliate equation, have signs that contradict our expectations about the effect of rural isolation/underdevelopment. Montana and Wyoming, supposedly below the manufacturing growth threshold, show 20 percent higher foreign employment growth, when all other variables are held constant. In fact, employment growth in Montana and Wyoming was extremely high for Canadian corporations, perhaps because border locations facilitate transportation and communication between Canadian headquarters and U.S. branch plants--or because Montana and Wyoming are good locations for serving western regional markets that include western Canada. The foreign equation sharply contrasts with the domestic equations in tables 21 and 22, where *THRESHOLD* has the expected negative effect. Moreover, underdeveloped rural states (*RURAL*) failed to benefit from the regional dispersion of domestic manufacturing during the period. Interior, farm belt states have been neglected by domestic manufacturers despite strong demand in relation to local supply. The result has been the so-called "bicoastal economy" in the 1980s. The opposite is the case with foreign employment growth, for which *RURAL's* coefficients are both positive and significant, as shown in table 22.

Thus many interior states apparently did not benefit from the dispersion of domestic manufacturing. This was true even though firms became less tied to *R&D* and headquarters locations in response to the routinization of production and related spatial filtering of firms in middle and late stages of the industry life cycle (the *R&D* variable in table 21). In contrast, we cannot reject the null hypothesis that the estimate for *R&D* is different from zero in the U.S. affiliate equation. The estimate for *R&D* also fails to confirm the alternate hypothesis that foreign firms locate in innovative regions as part of an aggressive strategy to assimilate U.S. technology. The hypothesis is still open at the local level.

Taxes and Spending: Differences appear in the foreign and domestic response to tax and state spending variables as well. States with unitary tax laws had 1.7 percent slower foreign employment growth, *ceteris paribus*, according to table 22. At the same time, *UNITARY* had no statistically significant effect on domestic growth, as we expected. On the other hand, referring back to table 21, note that *CORPTAX* affected domestic employment growth and not

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[48]However, when *UNION* was regressed against the ITA's new plant data (the gross number for 1979 through 1983) it was negative and significant at the 1 percent level. A state's population was held constant in the regression, along with a set of other independent variables. *UNITARY* was the only other significant explanatory variable (at the 5 percent level). It was inversely associated with the location of new plants.

U.S. affiliate growth.[49] Apparently, the imposition of specific taxes on business profits tends to discourage regional investment from different organizational types.

Per capita state spending matters, as shown by the estimates for *STSPENDING*. However, it bolstered domestic employment growth only; spending dampened foreign employment growth. Oddly, specific state spending programs--the physical and human capital commitments such as vocational education spending per capita and highway disbursements--yielded poor results in the regressions.

Summing up, the most important finding to surface in our analysis of regional dispersion during the 1974-1983 period is that foreign investors did not merely follow the spatial adjustment pattern of domestic firms. Foreign investors were market driven, but primarily to regions where existing manufacturing activity was low in relation to demand. Although domestic manufacturing penetrated these regions too, the range of variables that affected domestic firms was greater. The reason may be that the range of organizational types and the stages of the industry life cycle are more diverse. For instance, the variables that influence firms in senescent stages of the industry life cycle--low wages and lower technology--affected only domestic, not foreign firms. Curiously, domestic employment growth was inhibited in states that failed to cross the development threshold, while foreign firms aggressively penetrated into these states and the isolated, underdeveloped hinterland in general. At the same time, foreign firms no longer appear strongly influenced by unionization right-to-work laws, evidence that previous perceptions about "inflexible" Northern labor is no longer true. Overall, it is apparent that foreign investors, in spite of their alien status and distant headquarters, have carved out a special niche in the periphery of the U.S. regional system.

6.3 Determinants of New Plant Investment in Counties

Our next consideration is the distribution of foreign investment at the subregional level, the second part of the two-stage process of site selection in the U.S. Regression analysis can assist us in our endeavor to pinpoint the local determinants of FDIUS as well. Previous studies of the local distribution of direct investment (Papa, 1980; U.S. Department of Housing and Urban Development, 1979) were basically descriptive, as was our discussion in section 5. The effects of variables like per capita income were not tested in a multivariate framework. The aim of our econometric analysis now is to isolate the determinants of plant investment in counties, independent of regional influences. Given the absence of employment or capital stock data at the local level, the analysis is based on the ITA's plant data series for 1979 to 1983. Only new plant sites were considered, because they most clearly involved a location decision. Since comparable data for domestic start-ups in counties do not exist, we cannot compare our findings with domestic investment patterns.

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[49]Note that the standardized estimate for *CORPTAX* is lower in comparison with the market variables (much lower than *MARKET*), *CLIMATE*, and each of the labor characteristics.

6.3.1 County Location Hypotheses

Explanatory variables were chosen in order to confirm or deny the role of urbanization, market accessibility, labor characteristics, technology assimilation, and taxes in the local selection of greenfield plant sites. The specific variables and the underlying hypotheses tested in the regression are the following.

Urbanization: The spread of foreign investment toward peripheral regions may lead us to wonder about the core-area tendencies of plant investment at the substate level. But the rationale for including urbanization in the regression should be obvious by now, given our discussion in section 5. Even isolated, underdeveloped regions have dominant urban areas that should be far more attractive to market-oriented oligopolies than hinterland counties. *URBAN*, the percentage of a county's population residing in urban areas, was added to the model not so much to test the hypothesis itself (we already know it has a very strong influence) as to see if other local characteristics affect the locational choices of foreign firms, after controlling for urbanization.

Market Access and Transportation: County per capita income is one potential measure of local market strength. However, the partial correlation between county per capita income and plant investment, with urbanization held constant, proved to be negative and insignificant. This result is not surprising: markets are primarily regional and national, rather than local, phenomena in manufacturing. A better measure of market attraction at the local level could be calculated by taking into account the geographical position of a county in relation to regional and/or national markets. Creating such a gravity variable for counties would wear down the stamina of the most tenacious researcher.

A more expedient measure of local accessibility to regional and national markets, one suggested by industrial location theory and our analysis of plant investment in the South, is county transport linkages. The role of transportation access has emerged in surveys of foreign firms at the substate level,[50] and it is probable that the connection of counties with the U.S. interstate highway system is particularly significant. Our transportation variable, *HIGHWAY*, is a dummy variable; its value is one if the county has an interstate highway connection and zero otherwise.

Labor: Of the several labor characteristics that might affect local site selection, consider first the county unemployment rate. The variable is commonly tested in studies of new plant location in cities and counties. Carlton (1983), for example, hypothesized that a high unemployment rate may lower the costs of assembling and maintaining a work force; at the same time, he believed that a low unemployment rate may serve as a proxy for healthy local economies. He concluded that the sign on the unemployment variable was ambiguous. For SMSAs Carlton found that unemployment tends to be positively and significantly associated with industrial "births" in some domestic industries and negatively

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[50]In a survey of nationally based, state-based, and foreign-based firms in North Carolina, foreign respondents strongly favored highway infrastructure in making local site decisions (Moriarity, 1983). See also Tong (1979).

associated in others. *UNCNTY*, a county's unemployment rate in 1979 relative to the state average, was tested in the regression to see what sort of effect it had, if any, on foreign start-ups.

The composition of the labor force provides an alternative, less ambiguous means of testing for the role of local labor force availability. Industrial life cycle theory suggests that different occupational types exert a pull on location as capitalist organizations mature. Specifically, the profit cycle model stresses that branch plants of mature oligopolies require concentrations of assembly and production labor.[51] High percentages of skilled and unskilled production labor will also pick up manufacturing urbanization economies (the attraction of different manufacturing firms to a common industrial site). It will be interesting to see if labor required for assembly-type production influences foreign investment even when *URBAN* is held constant. The skilled-unskilled labor variable is denoted as *PRODL*, the 1980 percentage of total manufacturing employment in skilled assembly and semiskilled manufacturing occupations.

We also tested to see whether employee compensation affects the county distribution of new foreign plants. The labor cost variable included in the regression is *PAYROLL*, the 1980 average county compensation per employee in manufacturing, relative to the state average. Typically, industrial location theorists postulate that worker compensation has a negative influence on plant start-ups in local areas; some limited empirical evidence is supportive (Carlton, 1983).[52] We must be careful not to naively accept the hypothesis for foreign firms, however. Because oligopolies can and do pay workers more than other organizational types do, low payroll costs may not be a critical local determinant. We found (in section 5) that new plant investment was strong in the South, where lower wages are the rule, but this phenomenon may be due more to the regional influence of unionization. The labor cost hypothesis should be eyed with skepticism at the local level as well, but was tested anyway because it receives so much attention in the literature.

Technology Assimilation: The percentage of a county's labor force in managerial and technical occupations in 1980, signified by *MANGTECH*, was also entered in the regression. The variable is not considered a labor characteristic as such, since foreign branch plants do not generally require large pools of local managerial and technical talent. Rather the variable was included in order to further investigate the aggressive, technology-assimilation hypothesis put forth by Sametz (1974), which probably will surface, if at all, at the local level. To reiterate, foreign firms may enhance their competitive position at home by locating near the source of innovation in the U.S., copying recent technical advances, and transferring this knowledge to source country operations. Profit cycle theory argues that clusters of innovative domestic firms are associated with concentrations of technical-managerial labor. While technology assimilation

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[51]Survey evidence supports our inclusion of this occupational type. Moriarity's (1983) results show that foreign investors in North Carolina sought local pools of skilled and unskilled labor.

[52]Carlton's study is limited because he covers only 3 of 450 3-digit SIC industries.

is apparently not a concern in the regional location decision, it may affect the final decision about where to locate within a region.

Taxes: The ongoing controversy in the public policy arena about the influence of taxes on industrial location will never be resolved unless the facts are thoroughly examined. To be sure, local taxes, like state taxes, raise the costs of business, but they simultaneously support the infrastructure and human capital needs demanded by industry. Including a tax variable in our county regression will help us further demystify the public perception about the effect of taxes as a locational deterrent. Although we found no evidence that general tax collections had any effect on the percentage change in employment among states, specific taxes on business profits may hurt a state's industrial recruitment efforts. Perhaps county property taxes affect substate investment decisions as well.[53] The county tax variable, *PROPTAX*, is 1977 property taxes per capita relative to the state average.[54]

6.3.2 Methodology

The plant location decision was modeled as a discrete choice problem: whether or not to invest in a county on the basis of the combined county characteristics described above. For the dependent variable, a county that received a foreign-owned plant had a value of one; a county that received no investment had a value of zero. With a dummy dependent variable, ordinary least squares is no longer a valid estimating procedure. Models of qualitative choice, where the dependent variable is dichotomous, are best estimated by multinomial logit methods. The dependent variable is then interpreted as the logarithm of the odds that a county will receive new plant investment, given a set of local factors.[55]

However, not all counties in the U.S. were considered. Only those counties with at least 50 manufacturing plants were included. The first step was to eliminate counties without significant manufacturing activity, that is, localities that are unlikely to have received foreign investment. The next step was to control for state and regional influences in order to focus better on local factors. The point of the regression was to determine the effect of the independent variables on the probability that investors chose specific localities within regions and states. One method of neutralizing state influences is to take a

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[53]Carlton's (1979; 1983) regressions show that local taxes do not seem to matter in the location of plant births.

[54]Ideally, we would test a number of other hypotheses. Land availability and cost may play a role in the locational decision, but these data were not available in a machine-readable format. Although additional transport variables (air and port facilities) and local quality of life factors such as educational opportunities, cultural activities, parks, and other amenities are reputed to exert a pull on plant location, it would it take a considerable effort to obtain such county-level data.

[55]For other industrial location studies using a logit estimation procedure, see Luger and Shetty (1985) and Bartik (1985).

random sample of counties within each state that did not receive investment, equal to the number of counties that did. This procedure makes it impossible for states with low amounts of foreign investment to have more zeros than ones, enabling us to focus on local influences.[56] Following this method, we end up with 176 counties with new plant investment (dummy value equals one) and 176 counties with no investment (dummy value equals zero). We will refer to the dependent variable as *NPDUM*.

6.3.3 Regression Results

We have identified seven independent variables that might explain the probability of new plant location.[57] Three regressors--*URBAN*, *HIGHWAY*, *PRODL*, and *MANGTECH*--are expected to show a positive association with the probability that a county received a foreign-owned plant. A priori, the signs on the coefficients for *PROPTAX*, *UNCNTY*, and *PAYROLL* are ambiguous. Property taxes may alternatively repel or attract new plants according to whether foreign firms react to the higher costs or desire quality schools, roads, and other public goods supported by the tax base. The unemployment rate could be taken as a token for labor availability (positively related to the probability of new plant investment) or the health of local economic conditions (a negative relationship). The sign on *PAYROLL* is uncertain because, although most firms strive to minimize payroll costs, a search for low wage areas within states is not believed to be a fundamental spatial objective except in the latter stages of the profit cycle.

Table 23 gives the statistical results of the regression. The model's log likelihood ratio, a maximum likelihood statistic analogous to an F-test in OLS estimation procedures, is highly significant and indicates that the overall model is quite acceptable. The R statistic reported in the table is similar to a multiple correlation coefficient and is corrected for the number of estimated parameters. It is reasonably high for cross-sectional logit models.[58]

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[56]See Wheat (1976) for a further discussion of this methodology.

[57]All the independent variables were measured in logs. Similar results were obtained when the regression was run on untransformed variables, but the log specification is somewhat easier to interpret and is commonly used in logit models.

[58]*R* measures how the dependent variable is related to all the regressors at once. *R* has a zero value if the model has no predictive power and one if it predicts perfectly. A comparison of this model and other cross-sectional logit regression revealed that the *R* statistic in Table 23 is easily within the range that we should expect. For example, it is considerably higher than an example Pindyck and Rubenfeld (1976) extracted from the literature to illustrate logit regression procedures. The study examined the voting decisions of 435 individuals in a local school bond referendum. Although the *R* statistic was not reported (as usual, only the log likelihood ratio is given), the data are given in an appendix. When these data were estimated by the same maximum likelihood logit procedure used in this study, the *R* was only 0.143, compared with 0.332 for the regression in this study.

Table 23

County Determinants of New Foreign Plant Location

Independent Variables	Dependent Variable: NPDUM Parameter Estimates	Partial R
URBAN	4.2467*** (0.9748)	0.187
HIGHWAY	1.1488*** (0.4305)	0.102
PRODL	7.3826** (3.7663)	0.075
UNCNTY	-0.3153 (0.8772)	0.000
PAYROLL	1.6571 (1.0908)	0.024
MANGTECH	16.1016** (7.7554)	0.069
PROPTAX	-0.2383 (1.0961)	0.000

Adjusted R = 0.332 Log Likelihood Ratio = 487.98***

Number of observations = 352

Notes:
Standard errors are in parentheses
*** Significant at 1 percent level
** Significant at 5 percent level

All variables are measure in logs

We can interpret the coefficients as the proportional change in location probability caused by a one percent change in an explanatory variable, when the other variables are held constant. *URBAN* and *HIGHWAY* differ from zero at the 1 percent level of significance, while *PRODL* and *MANGTECH* are significant at the 5 percent level. The signs on these estimated coefficients correspond to our expectations. In other words, all else being equal, higher locational probabilities are associated with higher urbanization, interstate highway links, production labor, and managerial-technical labor. The partial Rs reported in table 23 measure the individual contribution to the model for each of the explanatory variables, when other variables are held constant.[59] Evidently, *URBAN* is most closely associated with the likelihood of a plant location, followed in order by *HIGHWAY*, *PRODL*, and *MANGTECH*.[60]

The sign on *PROPTAX* is negative, suggesting that higher locational probabilities are associated with lower property taxes; but the estimate is insignificant. The relationship between UNCNTY and the probability of location is positive, which is what we would predict if unemployment were a proxy for a firm's assessment of local economic conditions. But again, the coefficient on *UNCNTY* is statistically indistinguishable from zero. Finally, PAYROLL (manufacturing payroll cost per employee relative to the state average) is positively related to the probability that a county received a new foreign-owned plant. This suggests that U.S. affiliates seek skilled manufacturing workers within a state and are not deterred by higher costs. The estimate for *PAYROLL* is significant at the 11 percent level.

7. CONCLUSIONS

Our analyses of regional and subregional determinants shed new light on the locational pattern of FDIUS and on the foreign multinationals' unique place in U.S. regional development. The evidence shows that in 1974 foreign firms were more adverse to regions dominated by organized labor than domestic firms. But, in contrast with the change in domestic employment between 1974 and 1983, we detected a *reversal* in the trend for foreign firms, possibly because foreign investors were less "paranoid" about American unions.[61] Recognizing the importance of FDIUS as a potential source of jobs for its members, unions have traveled abroad and sought to offset their adversarial image to foreign capital. In fact, the Great Lakes region actually gained the largest increase in employ-

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[59]Like partial correlation coefficients, partial *R*'s in the logit procedure range in value from -1 to 1.

[60]As a check to see if the county occupational percentages tested in the regression were really significant, and not an econometric quirk, the occupational variables were dropped from the model and four different occupations were entered in their place: sales, transport, service, and agricultural. All were highly insignificant, with the exception of agricultural labor, which was negatively and significantly associated with the probability of *de novo* investment.

[61]A similar reversal occurred in Great Britain. With a rise of foreign acquisitions during the 1970s, overseas corporations favored core manufacturing regions following two decades of dispersion to peripheral regions (Smith, 1982).

ment (4 percent) between 1982 and 1983 (Howenstine, 1984). It is still too early to tell where this trend will go, but as domestic deindustrialization has hit the "Industrial Heartland," local and state agencies have been particularly aggressive in pursuing FDIUS and the payoff is beginning to show up statistically.

Threshold barriers have kept some underdeveloped manufacturing states from attracting jobs from domestic investors. Yet, the dispersion of foreign investment was unique in that it was apparently not dampened by below-threshold status. We must refrain from drawing any firm conclusions about the threshold hypothesis, however, because a few investments in isolated regions by Canadian firms are not necessarily indicative of any general trend. Another regional characteristic that uniquely affected foreign growth in the 1974-83 period was the unitary tax. It is interesting to note that some states, eager to attract FDIUS, responded to pressure from foreign firms for a repeal of unitary tax laws in the 1980s. The laws have been abolished or modified in Oregon, Colorado, Indiana, Massachusetts, California, and Florida, and repeals have been proposed in Idaho and Utah. When Oregon bowed to Japanese companies and rescinded its unitary tax in July, 1983, a large influx of Japanese electronics investment ensued during 1984 (*Business Week*, 1984). The speed of the Japanese investors' response corroborates our finding that unitary taxes put states at a disadvantage in the competition for jobs from FDIUS.

Notwithstanding these disparate influences on the growth of affiliate employment, the growth of foreign investment mirrored domestic investment in its response to other factors. It is clear that regional markets played a significant role in the spread of both foreign and domestic jobs. Within regions, our findings tend to belie the impression often given by anecdotal stories in the business press that foreign investors have largely chosen to build plants in nonmetropolitan America and are primarily cost driven (for example, Carlson, 1986). There is much more to location than costs. For foreign oligopolies, it appears that substate plant location is a function of urbanization, concentrations of skilled and semiskilled production labor, innovative capacity (high proportions of managerial and technical labor), and transportation accessibility.

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